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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

April 2001

Data Assimilation
Meteorological Office
London Rd
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RG12 2SZ

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

Dr. B. Macpherson
Mesoscale Data Assimilation and Observational Monitoring
Meteorological Office
London Road
Bracknell
Berkshire
United Kingdom
RG12 2SZ

2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. April 2001. Included statistics for ATOVS sounding data from NOAA-16.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa). :Wind speed ($m\ s^{-1}$). :Wind direction (Degrees).
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)

SELECTION CRITERIA	:NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 $m\ s^{-1}$	(wind speed),
		≥ 30 degrees	(direction).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
	3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
BOAB	ALL	P	SUR	49	0	0	3.7	-5.2	6.4
CGDS	ALL	P	SUR	132	126	95	2.9	-11.9	12.3
CG2960	ALL	P	SUR	103	33	32	1.2	0.0	1.2
C6FP2	ALL	P	SUR	22	0	0	1.3	7.9	8.0
C6QX	ALL	P	SUR	24	0	0	2.0	5.8	6.2
DGSR	ALL	P	SUR	45	0	0	1.6	-4.6	4.9
DPBP	ALL	P	SUR	33	9	27	6.6	-5.8	8.8
D5XH	ALL	P	SUR	26	6	23	4.1	-5.5	6.9
ELJL8	ALL	P	SUR	54	0	0	1.8	6.2	6.4
ELMR	ALL	P	SUR	27	0	0	2.0	-7.3	7.6
ELOV9	ALL	P	SUR	43	6	14	6.2	4.3	7.5
ELVJ9	ALL	P	SUR	43	0	0	0.9	-5.6	5.7
ELWR	ALL	P	SUR	41	0	0	1.0	-7.0	7.0
H3EP	ALL	P	SUR	37	0	0	4.3	-4.6	6.3
KHRP	ALL	P	SUR	70	0	0	1.6	6.6	6.8
KMJL	ALL	P	SUR	51	0	0	1.6	-4.0	4.3
LADB2	ALL	P	SUR	27	6	22	5.0	-5.0	7.1
LAFQ5	ALL	P	SUR	35	0	0	1.5	-7.2	7.3
LAOW5	ALL	P	SUR	23	0	0	1.3	9.3	9.4
P3YR5	ALL	P	SUR	49	0	0	1.4	6.5	6.6
UAMR	ALL	P	SUR	36	2	6	1.1	-12.1	12.2
UASP	ALL	P	SUR	23	0	0	2.4	4.1	4.8
UBAU	ALL	P	SUR	25	0	0	2.5	-5.1	5.7
UCJB	ALL	P	SUR	32	0	0	2.0	-4.1	4.5
UDDE	ALL	P	SUR	29	0	0	1.5	4.9	5.1
UDYG	ALL	P	SUR	103	14	14	6.3	3.4	7.1
UGGA	ALL	P	SUR	108	0	0	2.3	-4.3	4.9
UHLE	ALL	P	SUR	20	0	0	1.4	-10.4	10.5
UHVW	ALL	P	SUR	21	0	0	1.1	7.2	7.2
UIAI	ALL	P	SUR	28	1	4	3.2	-5.2	6.1
VCJM	ALL	P	SUR	43	42	98	0.0	-11.4	11.4
VCRT	ALL	P	SUR	32	0	0	1.5	-5.2	5.4
VGJC	ALL	P	SUR	23	5	22	8.8	2.1	9.0
VTST	ALL	P	SUR	27	0	0	1.1	-5.5	5.6
VVGC	ALL	P	SUR	34	0	0	1.6	10.4	10.5
VVMA	ALL	P	SUR	21	0	0	2.0	6.3	6.6
WE6970	ALL	P	SUR	28	0	0	1.0	-4.3	4.4
4XGV	ALL	P	SUR	30	0	0	1.7	7.5	7.7
62117	ALL	P	SUR	87	0	0	2.8	4.5	5.3
62137	ALL	P	SUR	35	0	0	0.5	-6.2	6.2
9VRA	ALL	P	SUR	65	0	0	1.4	-4.8	5.0
WIND SPEED									
DEHY	ALL	SPEED	SUR	25	9	36	2.4	1.7	2.9
ELWP8	ALL	SPEED	SUR	28	1	4	6.0	5.6	8.2
ELWZ5	ALL	SPEED	SUR	24	0	0	4.9	6.6	8.2
ELXE3	ALL	SPEED	SUR	29	1	3	6.9	11.1	13.0
ELXT8	ALL	SPEED	SUR	49	0	0	5.6	10.8	12.2
FKWK	ALL	SPEED	SUR	99	84	85	5.2	18.5	19.2
JKPS	ALL	SPEED	SUR	20	0	0	3.0	6.7	7.3
MQPU6	ALL	SPEED	SUR	21	1	5	5.0	5.2	7.2
MSBM4	ALL	SPEED	SUR	36	1	3	6.9	5.7	8.9
MWHT6	ALL	SPEED	SUR	40	0	0	2.4	-5.2	5.7
PPSO	ALL	SPEED	SUR	26	0	0	5.1	7.2	8.9
P3RX4	ALL	SPEED	SUR	20	0	0	4.8	12.8	13.6
SFRZ	ALL	SPEED	SUR	56	1	2	6.6	7.8	10.2
SGAK	ALL	SPEED	SUR	72	0	0	5.8	7.0	9.1
SXYY	ALL	SPEED	SUR	65	1	2	4.8	7.2	8.6

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED									
S6JM	ALL	SPEED	SUR	68	14	21	7.0	8.3	10.9
UIRN	ALL	SPEED	SUR	33	0	0	2.6	5.0	5.6
VNNM	ALL	SPEED	SUR	28	0	0	3.9	6.5	7.6
V2PC4	ALL	SPEED	SUR	23	0	0	2.0	5.5	5.8
V7AV6	ALL	SPEED	SUR	35	0	0	2.0	-5.4	5.7
ZDDT5	ALL	SPEED	SUR	35	0	0	2.9	5.0	5.8
3EJB9	ALL	SPEED	SUR	24	0	0	4.2	5.2	6.7
3FVG8	ALL	SPEED	SUR	22	0	0	2.7	5.5	6.2
44145	ALL	SPEED	SUR	236	0	0	4.1	5.2	6.6
WIND DIRECTION									
FPSS	ALL	DIRN.	SUR	93	4	4	87.4	-13.1	88.4

Figure 1. SHIP/SYNOP mean daily count. APRIL 2001

Main hours only

Global average number of observations in 24 hours = 21638

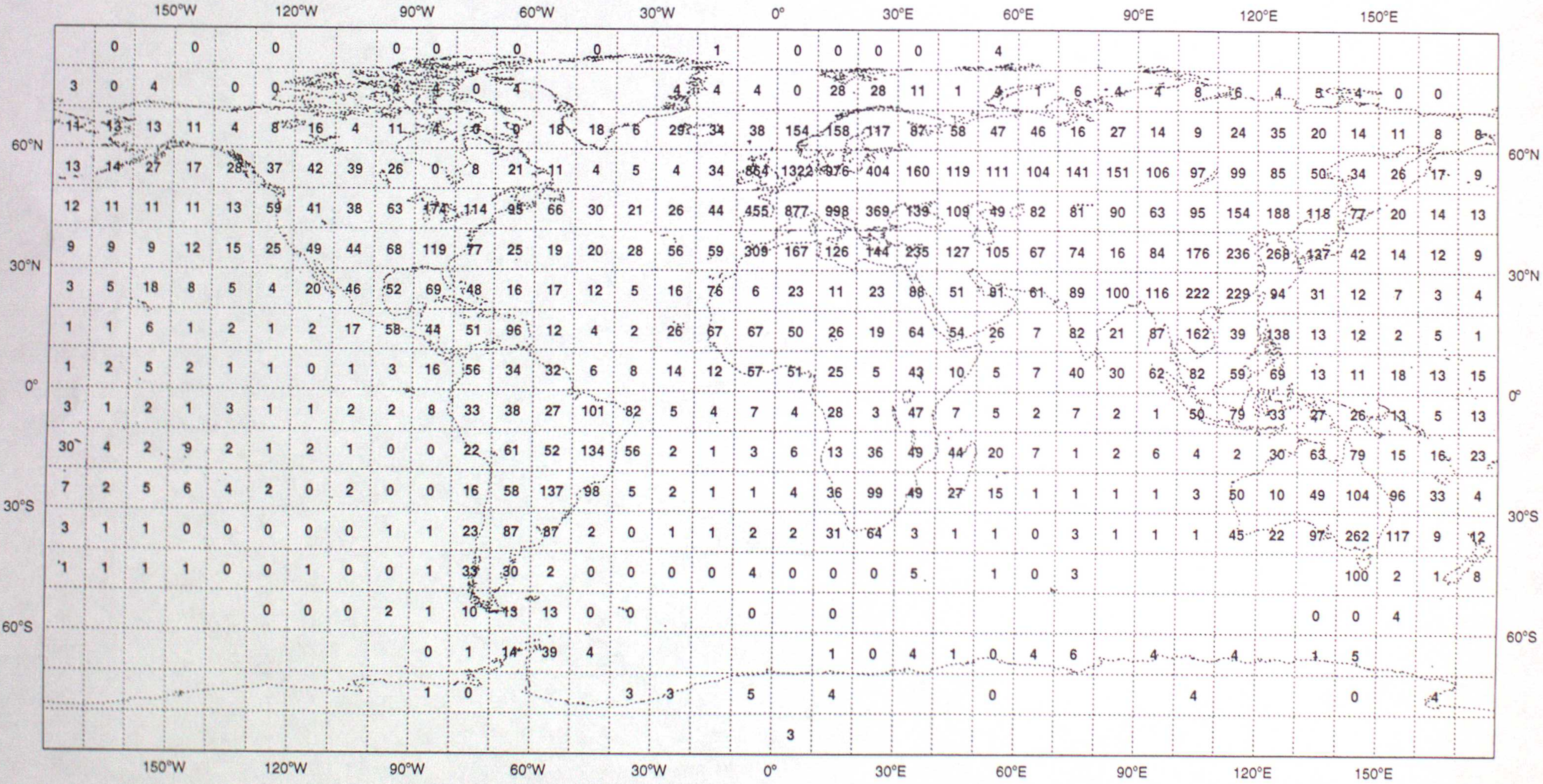

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed ($m\ s^{-1}$).
:Wind direction (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 $m\ s^{-1}$ (vector wind)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 $m\ s^{-1}$	(wind speed),
	≥ 30 degrees	(direction).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

```
IDENTIFIER  LAT.   LONG.   HOUR   ELEM   LEVEL NOBS   NGE   PGE     SD    BIAS    RMS

MEAN SEA LEVEL PRESSURE

31953        -20.8   -40.7  ALL     P      SUR    55     0     0    0.9     6.1    6.2
46561         28.4 -163.9   ALL     P      SUR   223     0     0    0.7    -4.1    4.2
61538         45.5     9.1  ALL     P      SUR   268   245    91    0.7    -1.2    1.4

WIND SPEED

17557        -34.0    84.1  ALL    SPEED   SUR   691     0     0    1.9    -5.3    5.6
52523         28.3   129.2  ALL    SPEED   SUR    22     0     0    2.5    -9.8   10.1
```

Figure 2. DRIFTER mean daily count. APRIL 2001
Main hours only
Global average number of observations in 24 hours = 9175

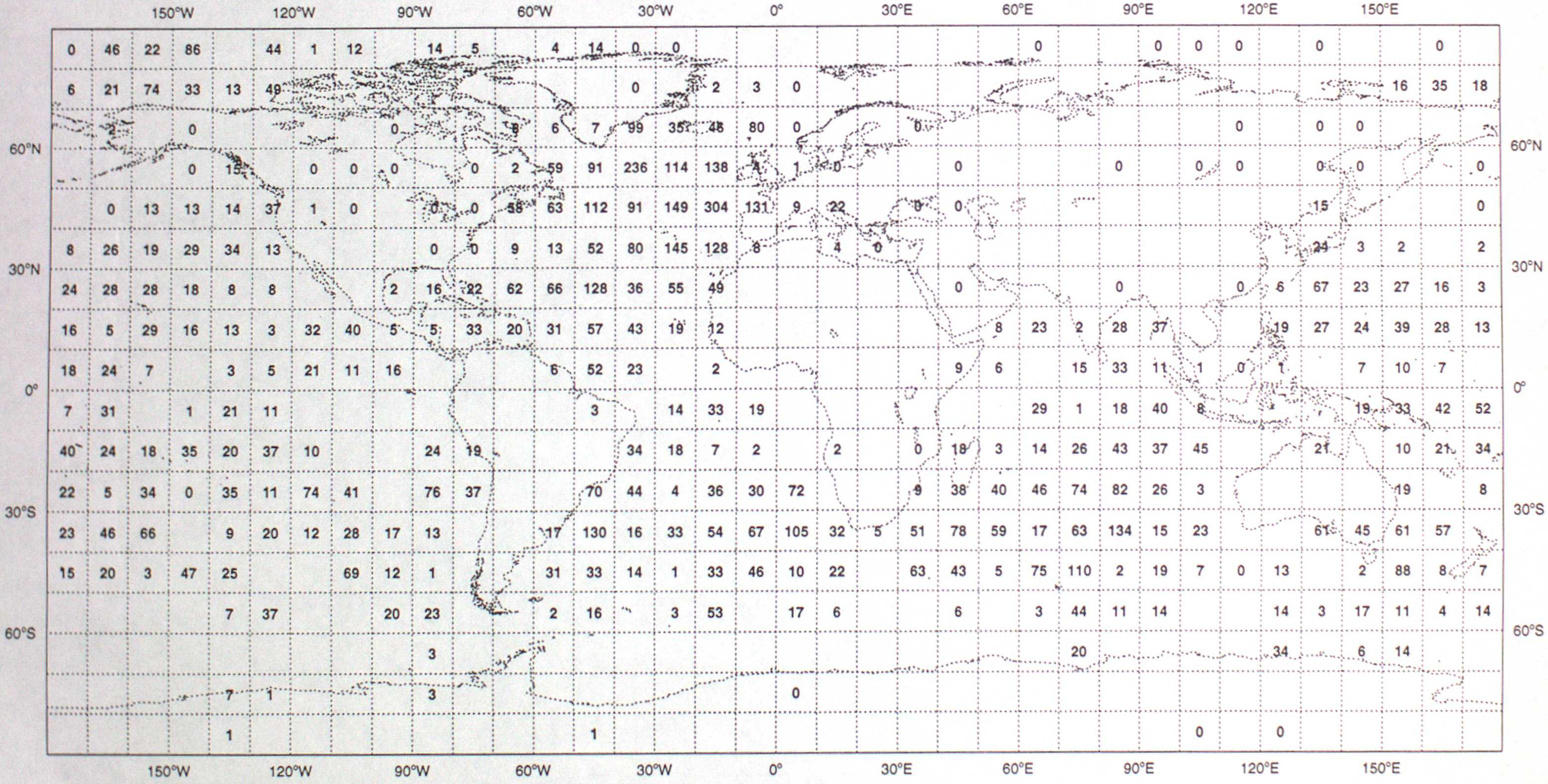

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 46 22 86 44 1 12 14 5 4 14 0 0 0 0 0 0 0 0
6 21 74 33 13 49 0 2 3 0 16 35 18
2 0 0 8 6 7 99 35 48 80 0 0 0 0 0
0 15 0 0 0 0 2 59 91 236 114 138 4 1 0 0 0 0 0 0 0
0 13 13 14 37 1 0 0 0 58 63 112 91 149 304 131 9 22 0 0 15 0
8 26 19 29 34 13 0 0 9 13 52 80 145 128 8 4 0 24 3 2 2
24 28 28 18 8 8 2 16 22 62 66 128 36 55 49 0 0 0 6 67 23 27 16 3
16 5 29 16 13 3 32 40 5 5 33 20 31 57 43 19 12 8 23 2 28 37 19 27 24 39 28 13
18 24 7 3 5 21 11 16 6 52 23 2 9 6 15 33 11 1 0 1 7 10 7
7 31 1 21 11 3 14 33 19 29 1 18 40 8 19 33 42 52
40 24 18 35 20 37 10 24 19 34 18 7 2 2 0 18 3 14 26 43 37 45 21 10 21 34
22 5 34 0 35 11 74 41 76 37 70 44 4 36 30 72 9 38 40 46 74 82 26 3 19 8
23 46 66 9 20 12 28 17 13 17 130 16 33 54 67 105 32 5 51 78 59 17 63 134 15 23 61 45 61 57
15 20 3 47 25 69 12 1 31 33 14 1 33 46 10 22 63 43 5 75 110 2 19 7 0 13 2 88 8 7
7 37 20 23 2 16 3 53 17 6 6 3 44 11 14 14 3 17 11 4 14
3 20 34 6 14
7 1 3 0
1 1 0 0

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
61816	10.9N	14.3W	69	M	24	9	38	0	1.2	-1.2	1.7
62056	32.8N	21.8E	625	S8	95	1	1	0	0.8	-5.8	5.9
62790	12.1N	24.9E	674	MS	86	3	3	3	1.3	4.2	4.4
63330	13.5N	39.5E	2070	MS	21	20	95	100	0.0	12.1	12.1
63333	11.1N	39.7E	1903	MS	38	1	3	0	0.7	4.4	4.5
63334	10.3N	37.7E	2515	MS	36	0	0	56	1.4	8.4	8.5
63402	7.7N	36.8E	1725	MS	36	0	0	14	1.1	6.1	6.2
63471	9.6N	41.9E	1260	MS	38	1	3	66	0.6	8.3	8.3
63478	5.9N	43.6E	295	MS	27	0	0	37	1.0	6.2	6.3
63602	3.1N	30.9E	1204	S	53	51	96	0	10.4	-3.9	11.1
63680	0.3N	32.6E	1144	S	22	1	5	5	0.8	-8.3	8.3
63801	4.9S	29.6E	882	S8	33	0	0	0	0.8	8.6	8.6
65401	10.9N	1.1W	201	M	29	0	0	0	1.3	4.0	4.2
68338	26.9S	24.6E	1234	S8	56	56	100	0			
68396	26.5S	31.3E	641	S8	48	1	2	0	0.6	4.4	4.4
68575	30.0S	30.0E	1175	S8	116	116	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
30554	54.5N	113.6E	995	MS	120	1	1	0	5.0	4.6	6.8
30967	49.9N	115.8E	623	MS	88	2	2	1	1.6	-6.5	6.7
36982	41.9N	78.2E	3635	S7	104	2	2	2	0.9	-4.4	4.5
40741	36.6N	61.2E	235	MS	79	0	0	0	1.3	-4.5	4.7
41254	23.1N	57.7E	1755	S8	57	57	100	0			
41396	16.0N	48.9E	700	MS	65	1	2	0	0.9	7.0	7.1
41466	13.7N	44.1E	1402	8	68	0	0	0	0.6	-5.6	5.6
41696	29.0N	66.6E	2015	S	78	37	47	0	1.9	-1.1	2.2
47022	40.8N	128.2E	1200	S	103	1	1	0	0.9	4.8	4.9
51495	43.5N	91.6E	874	M	120	0	0	0	2.2	6.5	6.9
52602	38.8N	93.4E	2734	S	120	0	0	0	1.6	-6.4	6.6
52866	36.6N	101.8E	2262	S	120	0	0	0	1.2	-4.7	4.9
52955	35.6N	100.8E	3201	S	120	1	1	0	0.8	12.5	12.5
56144	31.8N	98.6E	3184	S	120	0	0	0	1.3	-5.2	5.4
56146	31.6N	100.0E	339	S	120	120	100	0			
56444	28.5N	98.9E	3488	S	120	53	44	34	0.7	13.8	13.8
56462	29.0N	101.5E	2994	S	120	0	0	0	1.7	8.2	8.4

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	52	0	0	0	1.0	-6.9	7.0
80342	1.4N	77.3W	1796	S	36	0	0	3	1.5	4.1	4.4
80410	10.1N	69.3W	613	MS	113	30	27	2	1.4	0.7	1.6
83214	10.3S	54.9W	285	MS	87	0	0	0	4.3	-6.3	7.6
83235	12.4S	46.4W	604	MS	88	0	0	1	2.2	6.2	6.6
83332	14.1S	46.4W	826	MS	89	5	6	0	0.9	13.0	13.0
83408	14.3S	43.8W	447	MS	81	1	1	0	1.0	10.8	10.8
83488	17.8S	42.9W	1097	MS	89	89	100	0			
83531	18.6S	46.5W	940	MS	87	0	0	0	0.8	-6.6	6.6
83579	19.6S	46.9W	1004	MS	89	0	0	1	0.9	-4.1	4.2
83587	19.9S	43.9W	850	MS	88	1	1	1	0.7	-7.5	7.5
83773	23.1S	48.9W	793	MS	86	0	0	0	0.7	-10.6	10.6
83836	25.5S	50.6W	837	MS	89	0	0	0	0.8	-4.9	5.0
83953	30.9S	55.5W	231	MS	90	0	0	0	0.8	-11.0	11.0
84377	3.8S	73.3W	125	M	101	0	0	0	1.4	4.1	4.3

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
84401	5.2S	80.6W	49	MS	101	0	0	0	1.0	4.4	4.5
84455	6.5S	76.4W	281	MS	70	0	0	0	1.7	7.2	7.4
84472	7.1S	78.5W	2620	S	45	0	0	0	0.7	-6.2	6.2
84474	7.2S	76.7W	350	S	20	0	0	0	1.2	11.1	11.2
84686	13.6S	72.0W	3248	S	101	0	0	1	1.3	-4.5	4.7
84688	13.7S	73.4W	3444	S	42	1	2	5	0.6	-11.4	11.4
84720	14.9S	75.0W	567	MS	50	0	0	0	0.9	4.4	4.5
84782	18.1S	70.3W	468	MS	80	0	0	0	1.5	8.3	8.4
85140	14.3S	67.4W	140	MS	57	2	4	2	1.6	4.2	4.5
85264	18.5S	64.1W	1998	S	53	53	100	0			
85312	19.8S	63.9W	992	S	41	4	10	0	2.6	-6.1	6.6
85406	18.3S	70.3W	55	M	118	0	0	0	1.3	4.5	4.7
85432	22.5S	68.9W	2320	S8	81	0	0	1	1.2	5.5	5.6
85836	43.6S	71.8W	277	M	40	0	0	0	2.0	4.7	5.1

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71177	57.1N	61.5W	834	S	107	0	0	0	1.5	-4.0	4.3
71506	66.9N	136.3W	720	MS	118	0	0	3	1.5	-4.8	5.0
76118	30.4N	109.7W	1040	MS	34	1	3	0	0.7	-10.7	10.7
76243	28.7N	100.5W	250	MS	64	1	2	0	1.2	5.5	5.6
76658	19.2N	103.7W	494	MS	31	0	0	0	1.1	6.1	6.2
76743	18.0N	92.9W	10	MS	81	0	0	0	0.8	6.2	6.3
76903	14.9N	92.3W	118	MS	80	0	0	0	0.7	6.4	6.4
78482	18.2N	71.1W	3	M	78	0	0	0	2.2	-4.4	4.9

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	24	0	0	0	0.8	10.6	10.6
92036	2.4S	147.4E	1	8	234	234	100	0			
92068	10.0S	149.4E	1005	MS	21	0	0	0	0.7	-4.5	4.6
94130	14.8S	131.9E	120	MS	117	0	0	0	0.7	5.4	5.4
94384	24.1S	151.9E	34	MS	116	0	0	1	0.6	4.2	4.2
94868	37.8S	145.0E	35	MS	120	0	0	0	0.7	10.0	10.0
96505	3.7N	115.7E	909	S8	37	36	97	0	0.0	-0.4	0.4
97378	10.7S	123.1E	1	MS	53	51	96	0	3.5	-8.2	8.9

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
04416	72.6N	38.4W	3202	S	114	0	0	0	1.0	-4.3	4.4
06685	47.0N	9.1E	515	MS	120	0	0	8	1.2	6.2	6.3
10557	50.5N	11.1E	845	S8	360	360	100	0			
12140	54.4N	18.7E	2	MS	118	0	0	0	0.6	7.9	7.9
13269	44.3N	19.9E	176	MS	105	1	1	1	0.9	7.6	7.7
14554	44.9N	18.4E	140	S	59	2	3	0	1.7	-13.0	13.1
14650	43.8N	18.0E	972	S	60	60	100	0			
16021	46.3N	11.8E	2004	S	105	56	53	0	0.9	-1.3	1.6
17092	39.8N	39.5E	1218	S8	118	0	0	0	1.1	8.0	8.1
17203	38.9N	40.5E	1177	S8	89	0	0	4	0.8	6.9	6.9

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	43	0	0	37	1.5	-6.3	6.5
89208	90.0S	0.0W	2835	M	79	39	49	0	0.6	-0.1	0.6
89264	71.4S	68.9W	780	S	258	0	0	0	1.1	6.7	6.8
89272	74.8S	71.5W	1369	S	245	245	100	0			
89512	70.8S	11.8E	140	MS	110	3	3	2	2.6	-4.4	5.1
89612	66.3S	110.8E	390	S	254	254	100	0			
89627	77.2S	123.5E	3084	S	371	207	56	0	0.6	-14.1	14.1
89637	69.9S	130.0E	2560	S	299	177	59	0	0.6	14.2	14.2
89660	66.3S	162.3E	30	S	63	0	0	21	2.8	-7.3	7.8
89661	73.1S	169.6E	200	S	81	1	1	0	2.8	7.3	7.8
89666	76.7S	163.0E	200	S	83	83	100	0			
89744	74.0S	43.0E	3353	S	267	0	0	0	0.7	5.8	5.8
89769	78.5S	168.4E	50	S	378	378	100	0			
89847	67.6S	146.0E	30	S	295	3	1	0	1.6	-9.4	9.5

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	39	0	38	1.9	1.1	39	0	38	0	5.6	0.8
AAH	1083	1	39	1.3	0.4	1075	0	39	0	7.3	0.4
AAL	5999	1	22	1.3	0.1	5969	0	22	0	6.9	0.5
AAR	1495	0	5	1.6	-0.5	1493	0	6	0	7.6	0.3
ACA	3411	0	10	1.5	0.0	3406	0	10	0	6.9	0.5
ACI	76	0	51	1.4	0.0	78	0	51	0	7.3	2.2
AEA	839	1	3	1.5	0.1	827	0	4	0	7.7	0.8
AEL	633	0	7	1.7	-0.5	629	0	8	0	8.3	0.0
AEY	168	2	3	1.9	1.3	168	0	1	0	7.1	0.6
AFL	413	1	4	2.4	0.7	413	0	4	0	7.3	0.8
AFR	1616	1	6	1.7	0.2	1638	0	7	0	7.5	0.4
AIH	312	0	4	1.8	0.1	309	0	4	0	7.9	1.0
AJM	207	0	1	1.4	0.0	211	0	1	0	7.1	0.7
ALM	112	3	13	1.5	0.1	117	0	9	0	6.6	0.2
AMM	179	1	3	1.5	0.4	182	2	5	0	7.5	0.4
AMT	874	2	44	2.1	1.2	878	0	43	0	7.1	-0.2
AMX	275	3	5	2.1	0.6	270	1	4	0	9.2	1.2
ANA	1004	0	12	1.7	0.7	1011	0	13	0	7.6	0.9
ANZ	5573	0	36	1.4	0.4	5539	0	36	0	6.9	0.9
ARG	55	7	25	2.8	0.6	55	0	16	0	7.9	0.6
AUT	20	5	5	1.2	0.5	20	0	0	0	9.6	2.5
AVA	405	1	3	1.8	0.7	404	0	4	0	9.2	0.4
AVE	130	1	2	1.7	0.9	128	0	49	0	10.6	1.6
AVN	159	0	50	1.1	-0.2	159	0	51	0	7.0	0.6
AXF	34	0	24	0.8	0.2	34	0	24	0	7.7	2.6
AZA	710	1	6	2.0	0.1	715	0	6	0	8.1	0.4
BAF	21	0	0	1.7	-1.1	21	0	0	0	6.3	1.8
BAL	245	1	5	1.6	0.2	239	0	6	0	8.0	0.5
BAW	1066	0	8	1.8	0.1	1078	0	8	0	7.0	0.8
BBB	66	2	5	1.4	0.2	66	0	5	0	6.6	0.7
BLX	41	2	5	0.9	-0.1	42	0	2	0	6.3	0.8
BWA	274	0	62	2.1	1.1	273	0	7	0	9.7	0.4
CAL	181	1	8	1.6	0.3	188	1	8	0	7.3	1.1
CCA	256	2	14	2.1	0.3	279	1	100	0	12.2	-0.3
CES	516	1	6	1.5	0.4	531	1	9	0	9.3	-0.1
CFG	936	0	2	1.4	-0.5	924	0	4	0	8.0	0.8
CKS	27	0	0	2.1	0.6	27	0	0	0	7.4	1.6
CLX	384	0	5	1.6	-0.2	391	0	6	0	7.0	1.1
CMI	239	1	3	1.9	0.0	240	0	3	0	8.7	0.6
CMM	542	1	19	1.6	-0.2	537	1	19	0	6.6	1.0
COA	1269	1	28	1.2	0.0	1262	0	29	0	8.4	1.6
CRL	893	0	6	2.2	1.4	889	0	8	0	8.0	0.8
CSN	122	0	9	1.8	0.1	124	3	51	0	8.5	0.9
CTB	37	0	0	1.2	0.4	37	0	0	0	6.3	0.4
CTM	31	0	26	3.2	-1.5	32	0	19	0	6.2	-0.6
CUB	265	1	7	2.4	1.3	268	0	7	0	10.5	-0.5
DAF	20	0	5	3.1	-2.3	20	0	0	0	7.0	2.5
DAL	3044	0	42	1.2	-0.2	3067	0	43	0	6.3	0.2
DBY	424	0	2	1.3	-0.1	423	0	3	0	7.7	0.1
DLH	2003	0	7	1.5	0.1	1980	0	7	0	6.4	0.7
EDW	55	0	5	1.7	0.2	58	0	5	0	8.7	0.7
EEZ	133	2	100	3.1	1.9	126	0	5	0	6.4	0.2
EIA	324	3	43	1.8	-0.4	319	0	43	0	8.9	1.9
ELY	92	2	8	1.2	0.5	92	0	8	0	6.6	1.5
EVA	544	0	8	1.6	-0.2	552	0	8	0	7.8	0.3
EWW	124	0	3	1.5	0.2	122	1	4	0	6.9	1.6
FDX	2009	0	40	1.5	0.5	2035	0	40	0	7.0	0.7
FIN	306	0	4	1.5	0.3	302	0	5	0	7.1	0.4
FJI	865	1	46	1.5	0.4	845	0	46	0	7.7	0.4

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FOM	563	0	31	1.2	0.2	560	0	31	0	7.6	0.6
FWQ	124	0	56	0.9	0.2	124	0	56	0	4.7	0.2
GAF	83	0	7	1.3	-0.8	84	0	8	0	8.5	1.7
GCO	175	0	19	1.5	0.2	178	0	100	0	12.0	2.3
GHA	107	3	10	2.1	0.0	106	0	8	0	11.9	2.0
GRL	36	0	3	1.9	-0.7	36	0	0	0	3.7	0.8
GTI	223	1	5	1.7	-0.3	226	0	6	0	6.9	1.1
HAL	3991	1	36	1.4	0.4	3939	0	36	0	9.0	1.2
HLF	127	0	6	1.4	-0.5	128	0	7	0	8.0	0.7
HLN	31	0	0	1.1	0.5	31	0	0	0	6.1	1.3
HVN	85	1	6	1.4	0.2	85	0	5	0	4.0	0.5
HZM	29	0	14	4.8	4.1	28	0	14	0	12.7	-0.5
IBE	3233	1	7	1.6	0.3	3191	0	8	0	9.0	0.4
ICE	1083	0	3	1.4	0.1	1060	0	3	0	6.4	0.8
IWD	210	0	3	1.3	-0.3	207	0	3	0	7.7	0.8
JAA	66	5	9	2.6	0.7	66	0	3	0	8.8	1.7
JAL	5617	0	4	1.6	0.1	5621	0	4	0	7.5	0.6
JAZ	1142	0	4	1.9	1.0	1140	0	5	0	7.7	0.7
JKK	335	1	11	1.6	0.0	312	0	14	0	9.2	1.1
JMC	175	1	2	1.4	1.0	164	0	2	0	6.3	-0.1
KAL	3244	0	7	1.6	-0.1	3236	0	7	0	7.8	0.7
KLM	2379	0	6	1.5	0.2	2390	0	7	0	6.7	0.4
LAN	98	1	13	2.8	1.2	111	2	11	0	9.7	1.6
LAP	51	4	31	1.8	0.8	51	0	29	0	7.1	-0.8
LDA	76	1	4	1.1	-0.3	72	0	6	0	6.5	0.4
LDI	865	1	5	1.5	-0.3	871	0	5	0	8.1	0.0
LIB	1209	1	8	1.7	0.9	1224	0	9	0	8.5	0.3
LOT	145	0	3	1.8	-1.1	145	1	3	0	6.9	1.5
LPR	30	0	3	2.1	0.5	30	0	7	0	9.0	1.9
LTU	418	1	4	1.4	-0.1	419	0	4	0	6.9	0.8
LXJ	22	0	50	2.9	-0.7	22	0	45	0	7.1	-1.3
LXR	36	0	14	2.8	1.2	36	0	22	0	12.9	2.0
MAS	424	1	5	1.7	0.3	434	0	6	0	7.2	0.6
MAU	33	0	24	2.2	0.2	34	0	24	0	9.9	3.6
MON	98	0	1	1.4	0.3	97	0	0	0	4.1	0.5
MPD	311	1	5	1.5	-0.3	311	0	5	0	8.2	0.9
MPH	490	0	3	1.5	-0.6	492	0	4	0	7.1	0.3
NCA	704	0	3	1.5	0.2	698	0	4	0	7.3	0.7
NVR	25	0	0	2.0	-0.2	25	0	0	0	5.5	0.9
NWA	11004	0	10	1.6	0.5	11022	0	11	0	7.6	0.4
NZL	2397	0	9	0.9	0.0	2397	0	9	0	5.0	0.2
OAE	276	1	37	1.1	-0.2	274	0	39	0	9.3	1.7
OAL	24	0	0	1.4	-0.3	33	0	3	0	6.1	0.9
PAC	434	2	29	1.5	0.3	436	0	28	0	6.9	0.4
PAL	1565	1	10	1.4	0.1	1522	0	11	0	7.6	0.6
PAO	447	0	55	1.5	0.2	435	0	55	0	8.9	1.5
PIC	71	1	3	1.9	0.4	71	0	0	0	6.5	1.8
PUA	32	0	34	1.0	0.3	33	0	36	0	9.0	1.1
QFA	4188	0	62	1.5	0.5	4170	0	62	0	6.7	0.7
RAF	44	0	0	1.6	1.3	44	0	0	0	7.4	1.7
RAM	69	1	6	2.1	-0.4	69	0	7	0	8.7	0.6
RCH	222	3	17	2.4	0.1	204	0	100	0	11.2	2.5
RKA	71	1	3	1.5	-0.1	71	0	0	0	6.3	1.7
RRR	71	1	7	1.7	0.3	71	0	7	0	7.8	0.8
RSL	23	4	26	2.3	1.2	23	0	26	0	13.2	0.2
RYN	343	2	42	1.2	0.7	332	0	41	0	4.9	-0.3
RZO	316	1	3	1.5	-0.1	318	1	6	0	8.5	1.0
SAA	462	1	3	1.3	-0.2	464	1	4	0	7.3	0.4
SIA	358	0	6	1.9	0.6	356	0	5	0	6.3	0.6

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SLR	131	0	8	1.3	0.1	133	0	8	0	6.1	0.3
SOL	31	0	3	0.9	0.5	30	0	3	0	4.6	1.7
SVA	51	2	8	1.9	0.6	59	0	7	0	8.7	1.8
SWR	56	0	27	2.7	0.1	56	0	29	0	13.8	3.7
TAG	27	0	37	2.4	-0.6	27	0	37	0	8.7	-0.7
TAM	79	4	24	2.2	1.3	79	1	25	0	13.5	-0.4
TAP	860	0	3	1.4	-0.1	859	0	4	0	7.9	0.4
TBA	26	8	15	2.1	1.1	26	0	23	0	17.1	0.2
THA	126	0	6	1.3	-0.4	127	1	100	0	9.0	0.7
THT	106	2	32	2.9	0.4	103	0	25	0	8.4	1.6
TSC	51	0	16	2.7	0.5	50	0	34	0	9.6	3.0
TWA	1462	0	28	1.3	0.3	1438	0	28	0	6.4	0.4
UAL	142655	0	100	1.1	-0.2	142647	0	100	0	5.0	0.4
UPS	1726	0	43	1.8	0.5	1728	0	43	0	7.1	0.5
USA	205	0	6	1.4	-0.1	174	0	7	0	7.6	1.1
VIR	523	1	4	1.5	0.1	532	0	4	0	6.3	1.0
VKG	57	2	9	1.9	0.2	58	0	10	0	10.4	1.8
VRG	353	3	23	2.1	1.1	353	0	100	0	10.4	0.9
VVR	46	0	33	2.5	0.1	53	0	36	0	14.4	0.6
WOA	256	0	7	1.4	0.5	275	0	11	0	9.7	0.5
YSS	154	3	10	1.5	1.0	154	1	9	0	7.5	1.6
AR	2732	2	100	3.9	3.4	2719	0	7	0	6.4	1.2
AU	59345	0	13	1.2	0.5	59349	0	13	0	5.2	0.6
EU	116968	0	22	1.2	0.3	116967	0	22	0	4.7	0.6
KL	5963	18	24	1.5	0.9	5941	0	24	0	17.3	3.0
LH	3099	0	10	1.6	1.0	3075	0	10	0	5.5	1.1
MK	2235	0	6	1.5	1.2	2226	0	6	0	6.1	1.5
SA	3167	0	14	1.8	1.2	3166	0	12	0	5.6	0.7
SV	1715	0	100	2.7	2.5	1692	0	4	0	5.7	0.5
WA	342	6	19	1.8	0.5	335	9	100	0	11.8	-0.1
XX	4153	1	8	1.4	0.3	4131	0	9	0	9.7	0.9
N	677	2	23	2.0	0.5	709	0	23	0	8.5	1.3
US ACARS	862217	1	55	1.3	0.3	862208	0	54	0	5.3	0.7

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	36	11	31	1.0	-0.2	35	0	20	0	8.1	0.6
AAL	576	2	24	1.3	-0.2	568	1	23	0	7.3	0.5
AAR	28	0	21	1.1	-0.3	28	0	21	0	6.4	2.5
AFR	65	0	8	1.2	0.4	64	0	9	0	8.3	0.0
AMT	45	0	42	2.1	1.2	45	0	44	0	7.4	1.8
ANZ	127	5	30	1.3	0.3	127	0	28	0	7.3	0.9
AXF	43	0	30	1.3	0.3	43	0	30	0	5.8	0.0
BAF	31	26	39	0.8	0.1	30	3	20	0	8.6	0.0
CFC	112	4	9	1.5	0.9	109	0	7	0	8.1	1.2
CFG	31	0	6	1.6	0.1	31	0	6	0	9.8	-0.3
CLX	27	7	7	1.7	0.0	29	0	10	0	9.3	0.7
CMI	55	2	11	2.6	-0.5	56	0	5	0	9.0	2.9
COA	156	1	32	1.5	0.1	153	0	32	0	9.3	0.7
CRL	28	0	0	1.4	1.0	28	0	0	0	5.6	-1.3
CUB	92	2	5	2.0	1.1	93	0	9	0	11.2	0.8
DAF	21	19	24	3.2	1.1	20	0	0	0	4.5	0.4
DAL	332	1	50	1.1	0.0	333	0	50	0	6.2	1.0
DHL	55	2	58	6.6	-6.4	55	0	9	0	14.3	1.8
DLH	141	0	13	1.6	0.2	137	0	15	0	9.2	0.8
ELY	22	0	0	1.1	0.2	22	0	0	0	5.1	-1.3
EWW	58	0	5	1.5	0.3	59	0	3	0	6.8	0.5
FDX	469	2	21	1.5	0.6	476	0	19	0	7.6	-0.2
FXI	29	0	14	3.7	1.7	29	0	7	0	11.9	2.7
GAF	66	0	5	1.4	0.0	66	0	6	0	7.1	0.6
GCO	220	0	3	1.6	0.3	229	0	100	0	17.4	4.2
GHA	52	4	8	1.3	-0.5	51	0	8	0	12.4	-0.5
GTI	24	0	25	1.0	-0.3	23	0	26	0	6.6	0.7
HAL	180	1	38	1.8	0.2	180	0	38	0	7.2	1.3
IBE	99	2	20	1.1	0.0	101	0	21	0	8.1	0.5
ICE	86	0	3	1.7	-0.3	86	0	2	0	7.4	0.2
JAA	27	0	0	2.0	1.1	27	0	0	0	5.2	0.9
JAL	163	2	5	1.3	0.4	162	0	2	0	6.5	0.5
JAZ	258	2	6	1.9	0.9	257	0	4	0	7.5	-0.1
JMC	25	0	12	2.1	1.3	25	0	8	0	4.9	1.0
KAL	59	5	27	1.7	-0.3	56	0	25	0	7.4	2.5
KIW	76	1	30	2.8	2.2	76	0	29	0	6.4	0.6
KLM	60	2	10	2.0	0.3	60	0	8	0	6.1	-0.4
LAN	168	3	7	2.7	0.6	192	0	5	0	11.2	3.5
LDI	27	0	0	1.4	-1.2	27	0	0	0	5.7	0.3
LIB	148	0	3	1.4	1.0	147	0	7	0	8.2	0.2
NAT	21	5	5	1.6	0.0	23	0	0	0	5.2	0.9
NCA	84	0	1	1.6	-0.2	83	0	0	0	4.8	-0.8
NWA	339	1	19	1.6	0.5	337	0	20	0	8.1	0.6
NZL	6968	0	55	1.3	0.2	6968	0	55	0	4.8	0.5
PAL	40	0	5	0.9	-0.4	38	0	5	0	5.8	0.0
QFA	179	3	45	1.0	0.1	182	1	46	0	6.1	0.3
RCH	183	2	18	2.9	-0.4	179	0	98	0	13.3	3.0
RRR	182	1	19	4.1	3.3	180	0	14	0	9.9	0.1
SAA	48	0	4	0.9	-0.5	48	0	8	0	11.6	-0.4
SIA	40	3	5	2.0	0.6	40	0	0	0	4.5	1.2
SWR	28	0	14	0.9	0.5	30	0	27	0	14.7	6.0
TWA	27	0	33	1.0	0.1	28	0	32	0	5.1	-0.3
UAL	225033	0	100	1.2	0.0	224814	0	100	0	4.5	0.3
UPS	121	2	40	1.4	0.1	122	0	38	0	6.8	0.5
VHJ	72	0	4	2.4	0.1	72	0	0	0	9.1	1.6
VTA	21	0	5	2.8	-0.4	27	0	0	0	4.4	0.8
VVP	57	12	65	5.4	3.9	54	0	46	0	6.7	-0.9
WOA	25	0	16	2.2	-0.7	29	0	14	0	10.4	1.4

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AR	2113	1	100	3.0	2.4	2112	0	52	0	4.2	0.5
AU	92785	0	63	1.3	-0.1	92783	0	63	0	4.0	0.4
EU	493827	0	71	1.0	0.2	493218	0	71	0	4.3	0.1
KL	4551	21	66	1.5	0.9	4540	0	64	0	9.0	2.1
LH	1110	0	61	1.3	0.6	1094	0	61	0	4.1	0.7
MK	2228	0	53	1.2	0.5	2211	0	53	0	4.4	0.7
SA	2475	0	63	1.7	0.8	2475	0	63	0	4.7	0.6
SV	2696	0	100	3.3	3.1	2670	0	44	0	5.1	1.4
WA	42	2	17	1.2	0.3	39	13	100	0	9.1	-1.5
XX	855	3	10	1.7	0.1	854	1	13	0	11.9	1.1
US ACARS	1154054	0	71	1.3	0.3	1151523	0	71	0	4.6	0.2

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. APRIL 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 43526

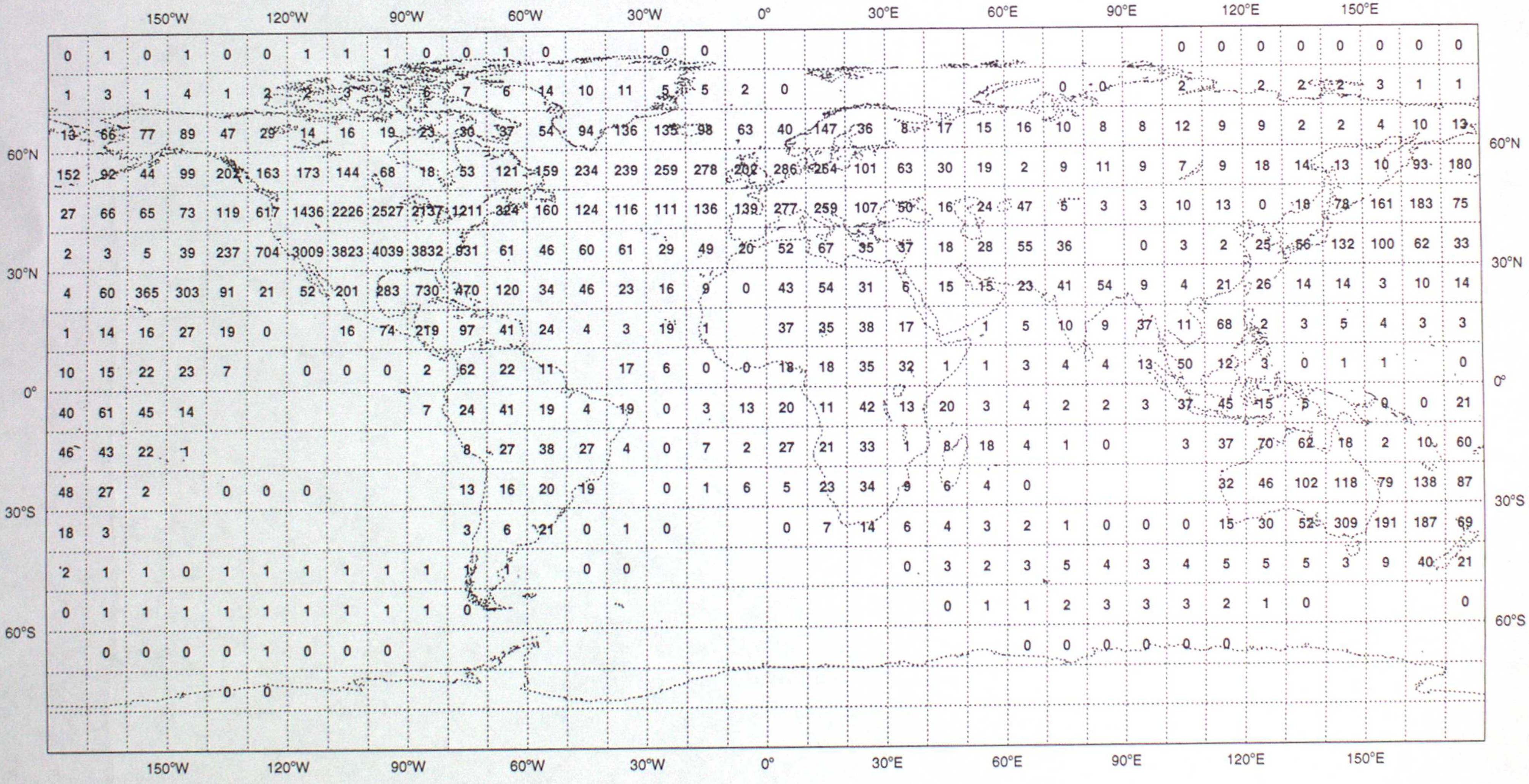
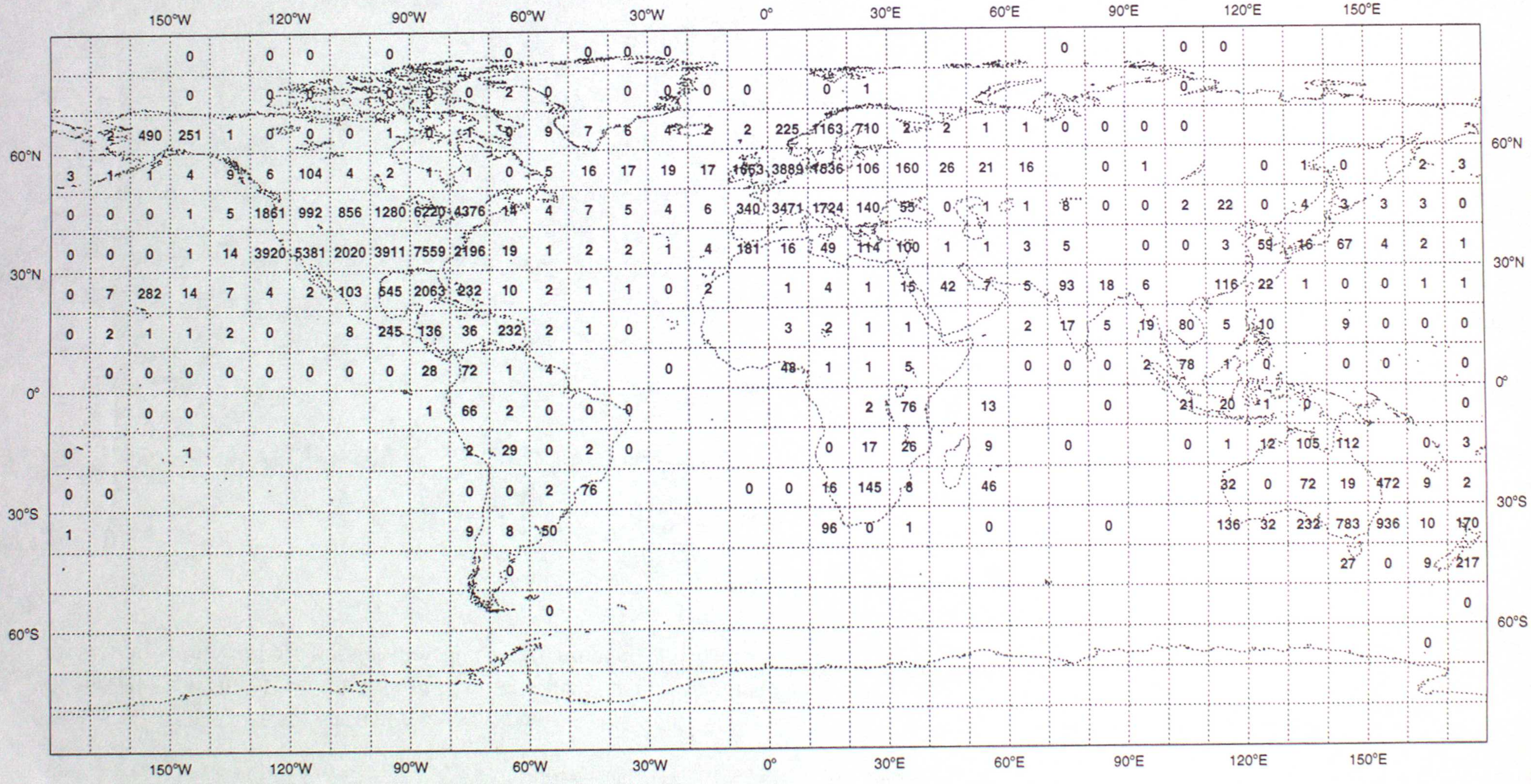

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
0 1 0 1 0 0 1 1 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0
1 3 1 4 1 2 2 3 5 6 7 6 14 10 11 5 5 2 0 0 0 2 2 2 2 3 1 1
13 66 77 89 47 29 14 16 19 23 30 37 54 94 136 135 98 63 40 147 36 8 17 15 16 10 8 8 12 9 9 2 2 4 10 13
152 92 44 99 202 163 173 144 68 18 53 121 159 234 239 259 278 202 286 254 101 63 30 19 2 9 11 9 7 9 18 14 13 10 93 180
27 66 65 73 119 617 1436 2226 2527 2137 1211 324 160 124 116 111 136 139 277 259 107 50 16 24 47 5 3 3 10 13 0 18 78 161 183 75
2 3 5 39 237 704 3009 3823 4039 3832 931 61 46 60 61 29 49 20 52 67 35 37 18 28 55 36 0 3 2 25 56 132 100 62 33
4 60 365 303 91 21 52 201 283 730 470 120 34 46 23 16 9 0 43 54 31 6 15 15 23 41 54 9 4 21 26 14 14 3 10 14
1 14 16 27 19 0 16 74 219 97 41 24 4 3 19 1 37 35 38 17 1 5 10 9 37 11 68 2 3 5 4 3 3
10 15 22 23 7 0 0 0 2 62 22 11 17 6 0 0 18 18 35 32 1 1 3 4 4 13 50 12 3 0 1 1 0
40 61 45 14 7 24 41 19 4 19 0 3 13 20 11 42 13 20 3 4 2 2 3 37 45 15 5 0 0 21
46 43 22 1 8 27 38 27 4 0 7 2 27 21 33 1 8 18 4 1 0 3 37 70 62 18 2 10 60
48 27 2 0 0 0 13 16 20 19 0 1 6 5 23 34 9 6 4 0 32 46 102 118 79 138 87
18 3 3 6 21 0 1 0 0 7 14 6 4 3 2 1 0 0 0 15 30 52 309 191 187 69
2 1 1 0 1 1 1 1 1 1 1 1 0 0 0 3 2 3 5 4 3 4 5 5 5 3 9 40 21
0 1 1 1 1 1 1 1 1 1 0 0 1 1 2 3 3 3 2 1 0 0
0 0 0 0 1 0 0 0 0 0 0 0 0 0
0 0

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. APRIL 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 66384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60°N 30°N 0° 30°S 60°S
0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 2 0 0 0 0 0 0 1 0
2 490 251 1 0 0 0 1 0 1 0 9 7 6 4 2 2 225 1163 710 2 2 1 1 0 0 0 0
3 1 1 4 9 6 104 4 2 1 1 0 5 16 17 19 17 1663 3889 1836 106 160 26 21 16 0 1 0 1 0 2 3
0 0 0 1 5 1861 992 856 1280 6220 4376 14 4 7 5 4 6 340 3471 1724 140 55 0 1 1 8 0 0 2 22 0 4 3 3 3 0
0 0 0 1 14 3920 5381 2020 3911 7559 2196 19 1 2 2 1 4 181 16 49 114 100 1 1 3 5 0 0 3 59 16 67 4 2 1
0 7 282 14 7 4 2 103 545 2063 232 10 2 1 1 0 2 1 4 1 15 42 7 5 93 18 6 116 22 1 0 0 1 1
0 2 1 1 2 0 8 245 136 36 232 2 1 0 3 2 1 1 2 17 5 19 80 5 10 9 0 0 0
0 0 0 0 0 0 0 0 28 72 1 4 0 48 1 1 5 0 0 0 2 78 1 0 0 0 0
0 0 1 66 2 0 0 0 2 76 13 0 21 20 1 0 0
0 1 2 29 0 2 0 0 17 26 9 0 0 1 12 105 112 0 3
0 0 0 0 2 76 0 0 16 145 8 46 32 0 72 19 472 9 2
1 9 8 50 96 0 1 0 0 136 32 232 783 936 10 170
0 27 0 9 217
0 0
0

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. APRIL 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

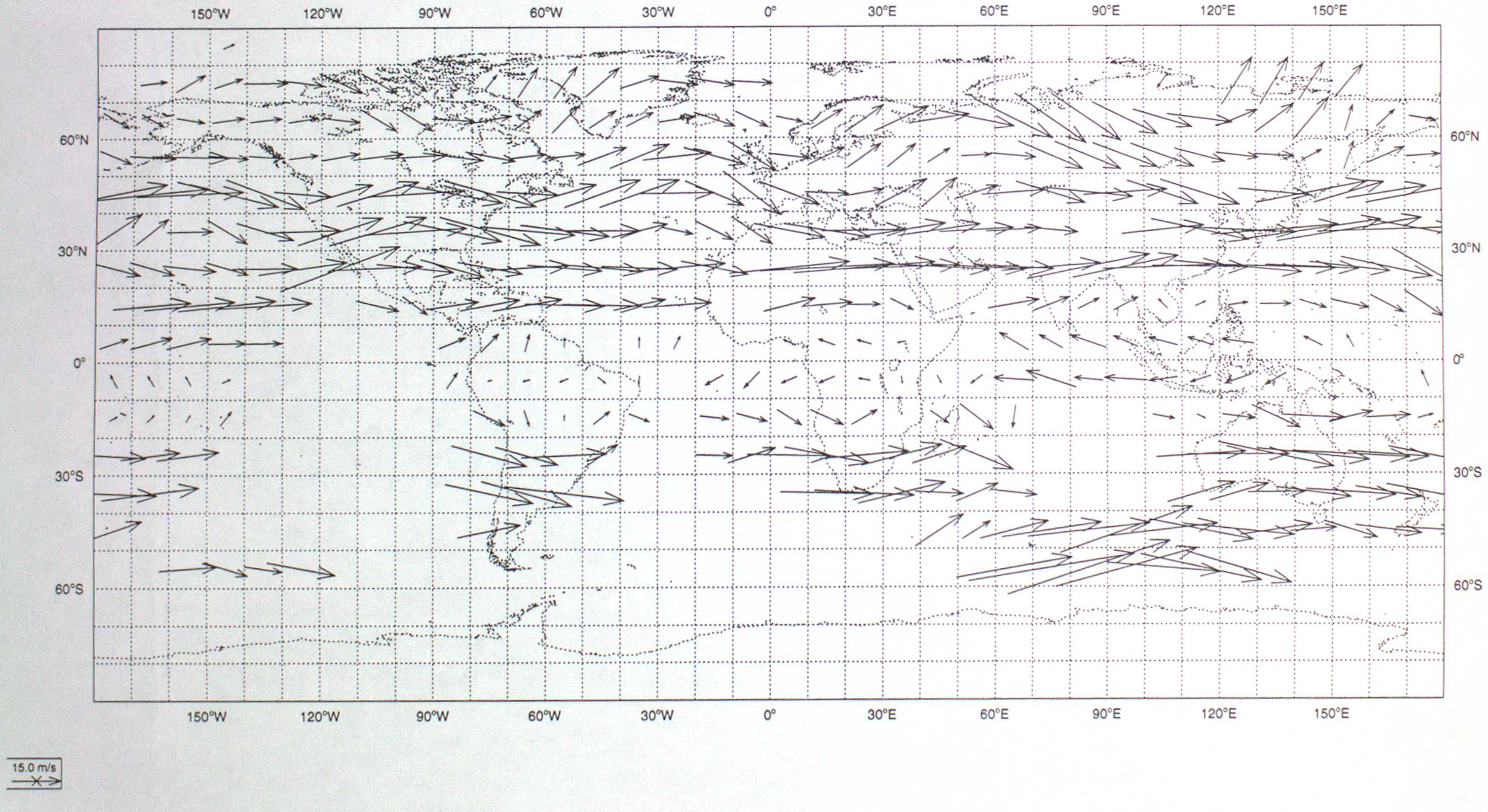
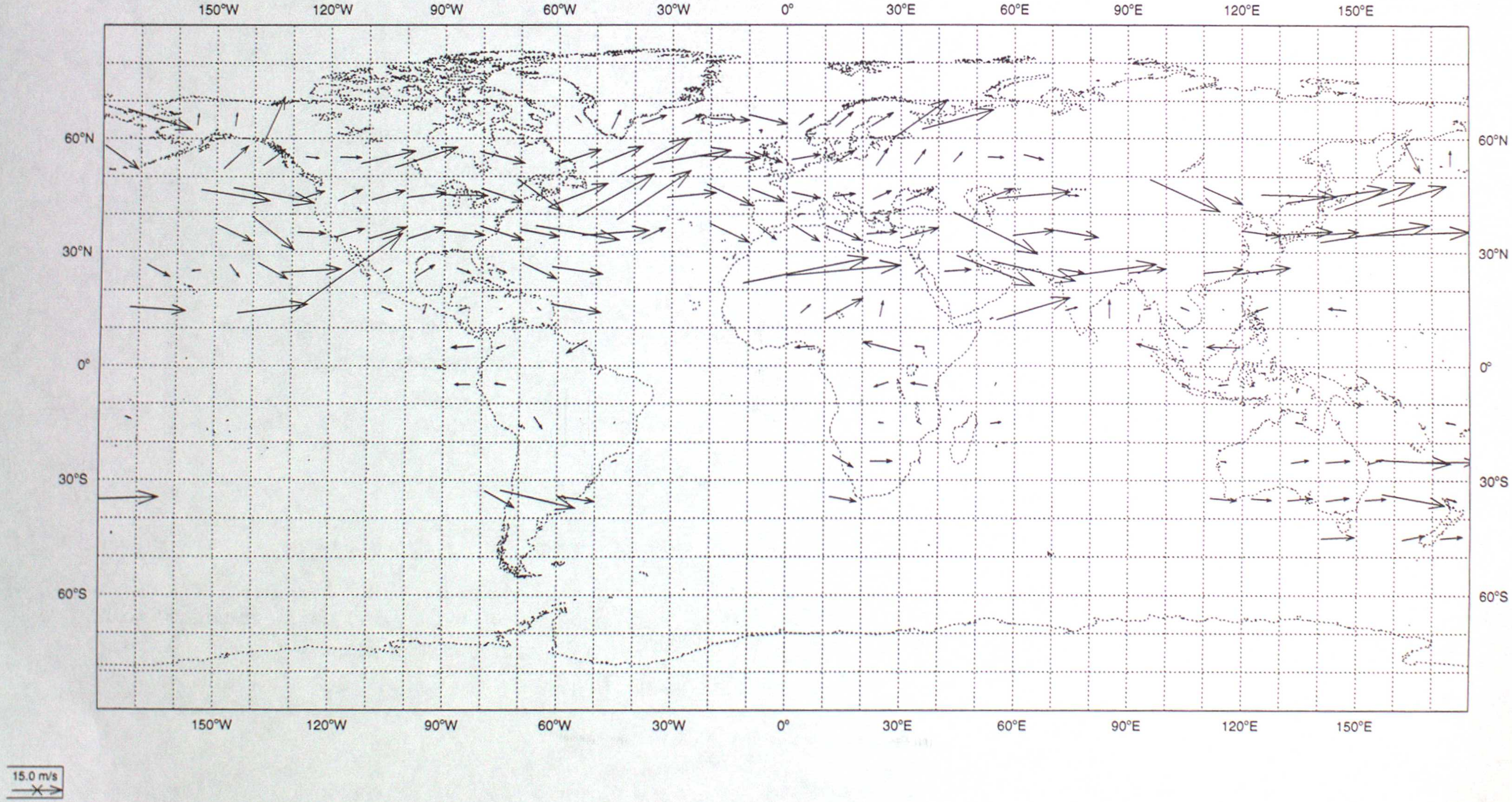

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. APRIL 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

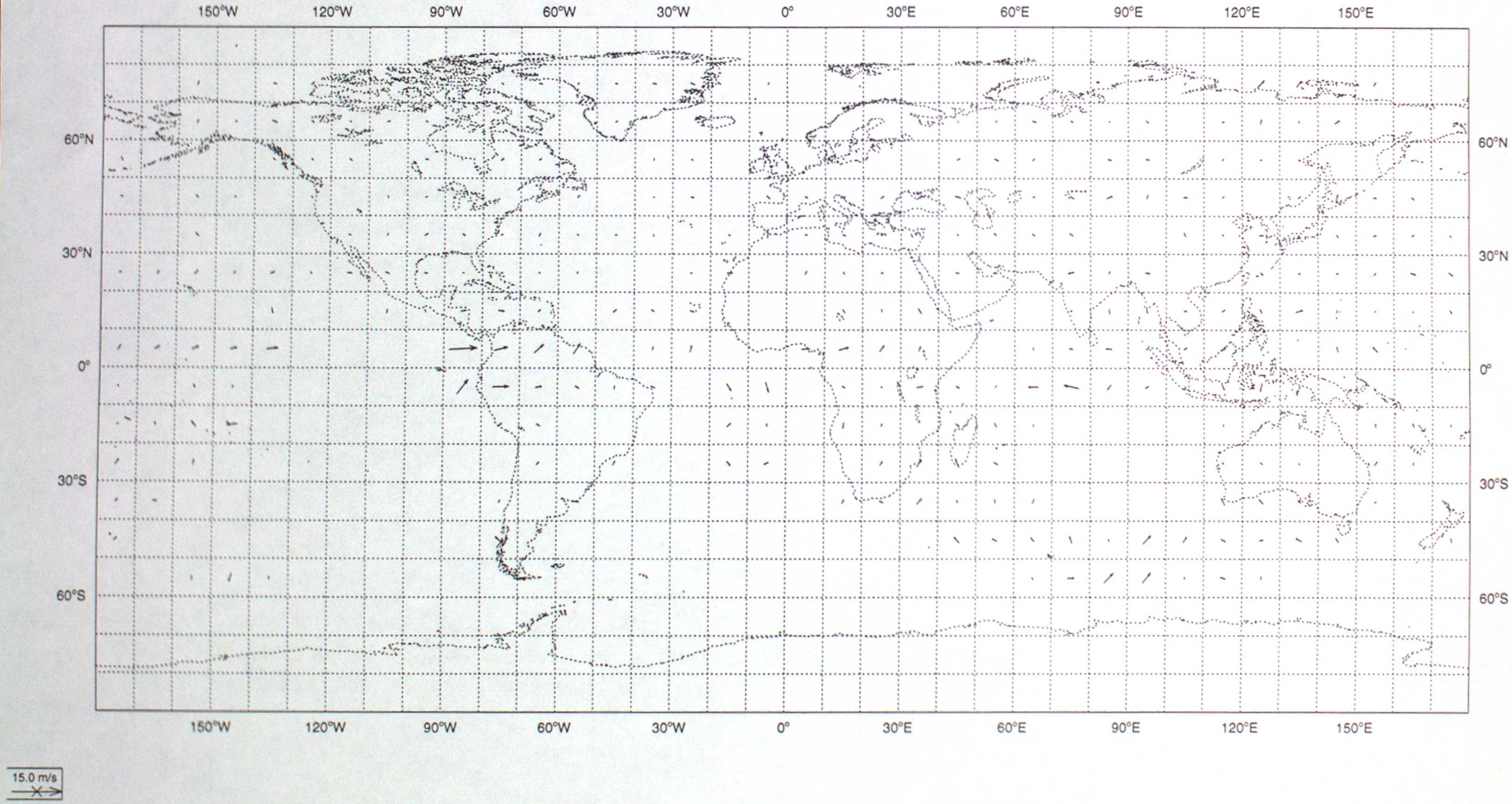


Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. APRIL 2001

Observations with O-B vector difference greater than 60 ms-1 excluded

Arrows are plotted where greater than 30 obs are present

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. APRIL 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

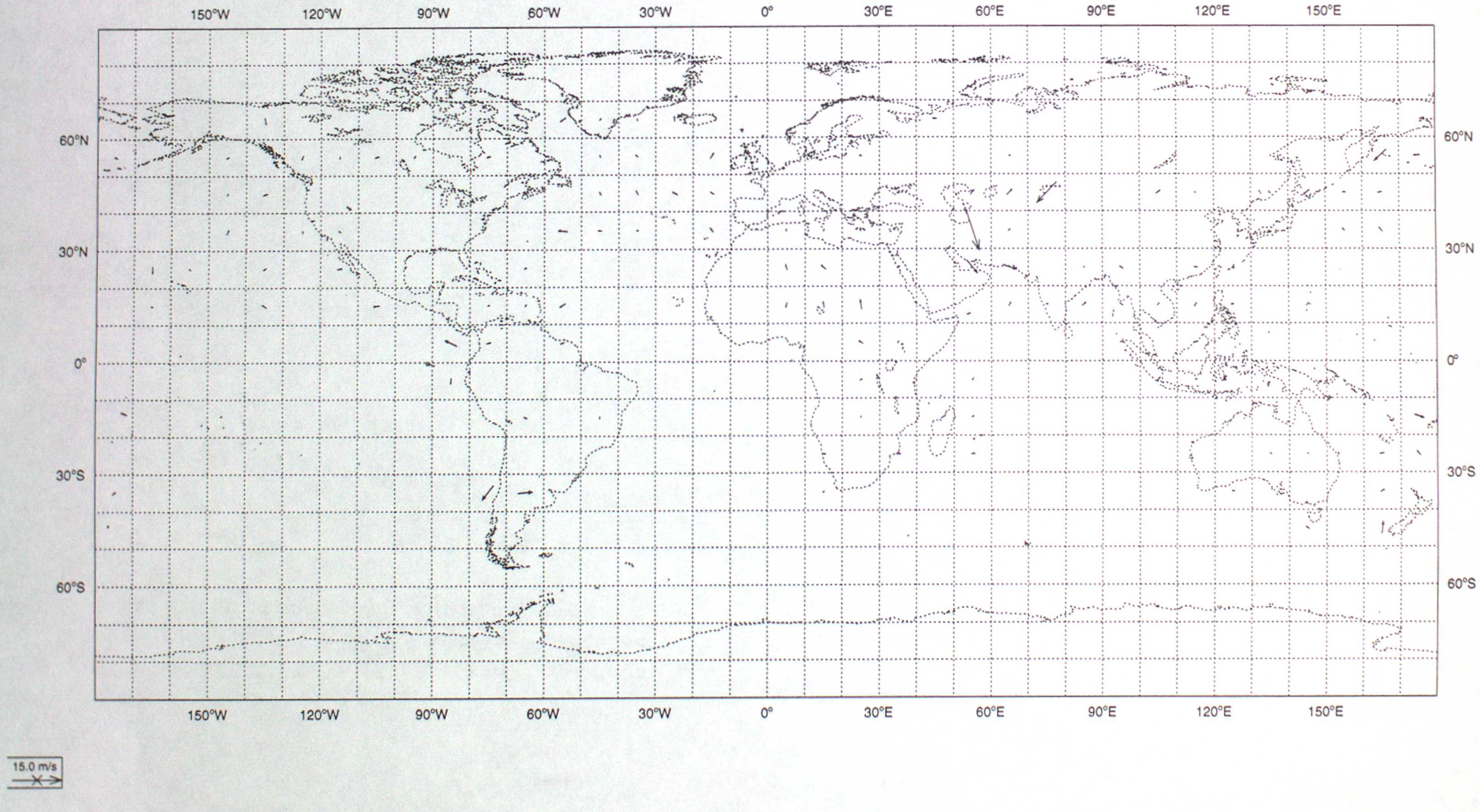

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). APRIL 2001

Observations with O-B vector difference greater than 60 ms-1 excluded

Values are printed where greater than 30 obs are present

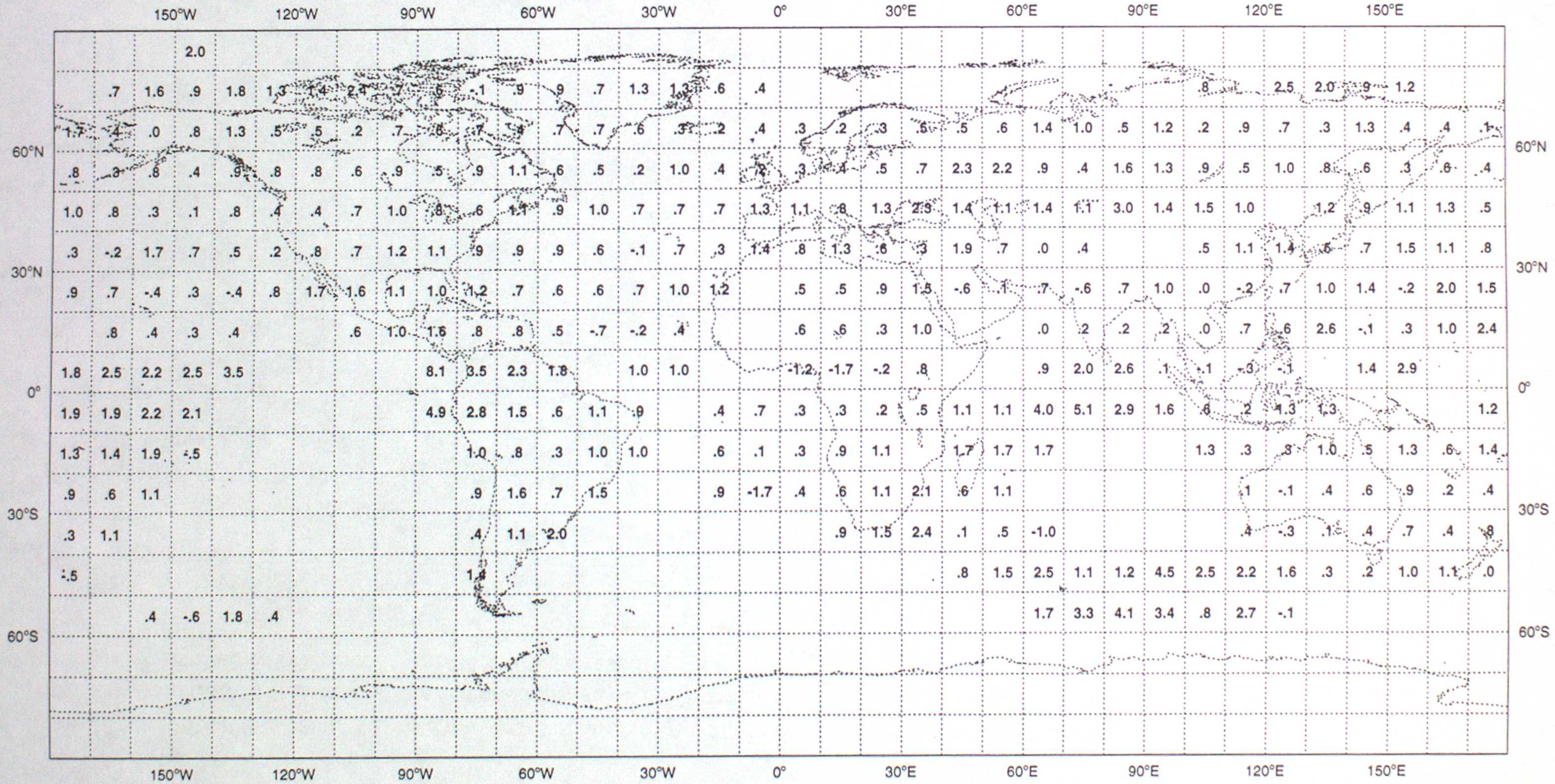
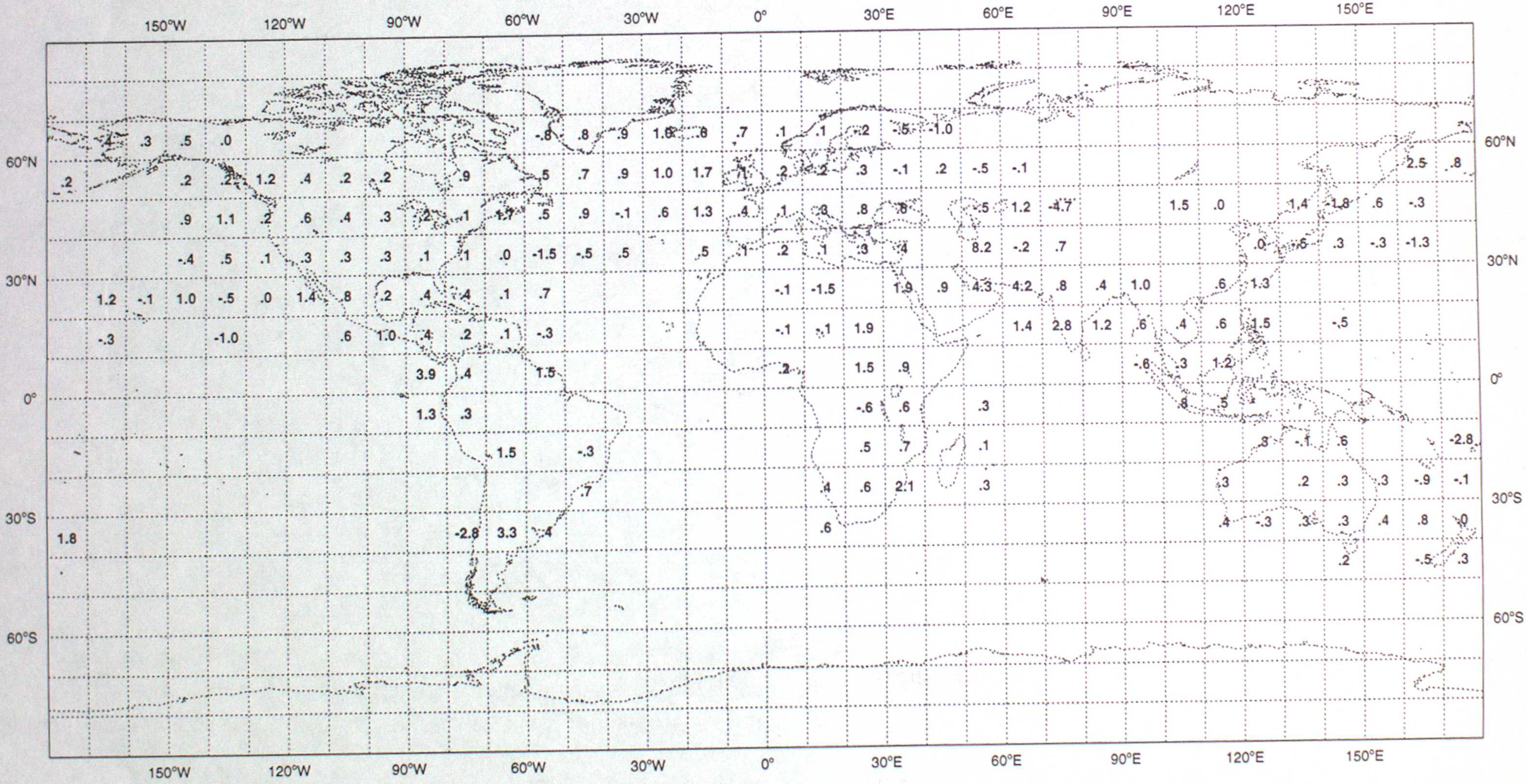

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
2.0
.7 1.6 .9 1.8 1.3 1.4 2.4 .7 .6 -.1 .9 .9 .7 1.3 1.3 .6 .4 .8 2.5 2.0 .9 1.2
1.7 .4 .0 .8 1.3 .5 .5 .2 .7 .6 .7 .4 .7 .7 .6 .3 .2 .4 .3 .2 .3 .5 .5 .6 1.4 1.0 .5 1.2 .2 .9 .7 .3 1.3 .4 .4 .1
.8 .3 .8 .4 .9 .8 .8 .6 .9 .5 .9 1.1 .6 .5 .2 1.0 .4 .2 .3 .4 .5 .7 2.3 2.2 .9 .4 1.6 1.3 .9 .5 1.0 .8 .6 .3 .6 .4
1.0 .8 .3 .1 .8 .4 .4 .7 1.0 .8 .6 1.1 .9 1.0 .7 .7 .7 1.3 1.1 .8 1.3 2.3 1.4 1.1 1.4 1.1 3.0 1.4 1.5 1.0 1.2 .9 1.1 1.3 .5
.3 -.2 1.7 .7 .5 .2 .8 .7 1.2 1.1 .9 .9 .9 .6 -.1 .7 .3 1.4 .8 1.3 .6 .3 1.9 .7 .0 .4 .5 1.1 1.4 .5 .7 1.5 1.1 .8
.9 .7 -.4 .3 -.4 .8 1.7 1.6 1.1 1.0 1.2 .7 .6 .6 .7 1.0 1.2 .5 .5 .9 1.5 -.6 .1 .7 -.6 .7 1.0 .0 -.2 .7 1.0 1.4 -.2 2.0 1.5
.8 .4 .3 .4 .6 1.0 1.6 .8 .8 .5 -.7 -.2 .4 .6 .6 .3 1.0 .0 .2 .2 .2 .0 .7 .6 2.6 -.1 .3 1.0 2.4
1.8 2.5 2.2 2.5 3.5 8.1 3.5 2.3 1.8 1.0 1.0 -1.2 -1.7 -.2 .8 .9 2.0 2.6 .1 .1 -.3 -.1 1.4 2.9
1.9 1.9 2.2 2.1 4.9 2.8 1.5 .6 1.1 .9 .4 .7 .3 .3 .2 .5 1.1 1.1 4.0 5.1 2.9 1.6 .6 .2 1.3 1.3 1.2
1.3 1.4 1.9 -.5 1.0 .8 .3 1.0 1.0 .6 .1 .3 .9 1.1 1.7 1.7 1.7 1.3 .3 .8 1.0 .5 1.3 .6 1.4
.9 .6 1.1 .9 1.6 .7 1.5 .9 -1.7 .4 .6 1.1 2.1 .6 1.1 .1 -.1 .4 .6 .9 .2 .4
.3 1.1 .4 1.1 2.0 .9 1.5 2.4 .1 .5 -1.0 .4 -.3 .1 .4 .7 .4 .8
-.5 1.4 .8 1.5 2.5 1.1 1.2 4.5 2.5 2.2 1.6 .3 .2 1.0 1.1 .0
.4 -.6 1.8 .4 1.7 3.3 4.1 3.4 .8 2.7 -.1

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). APRIL 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present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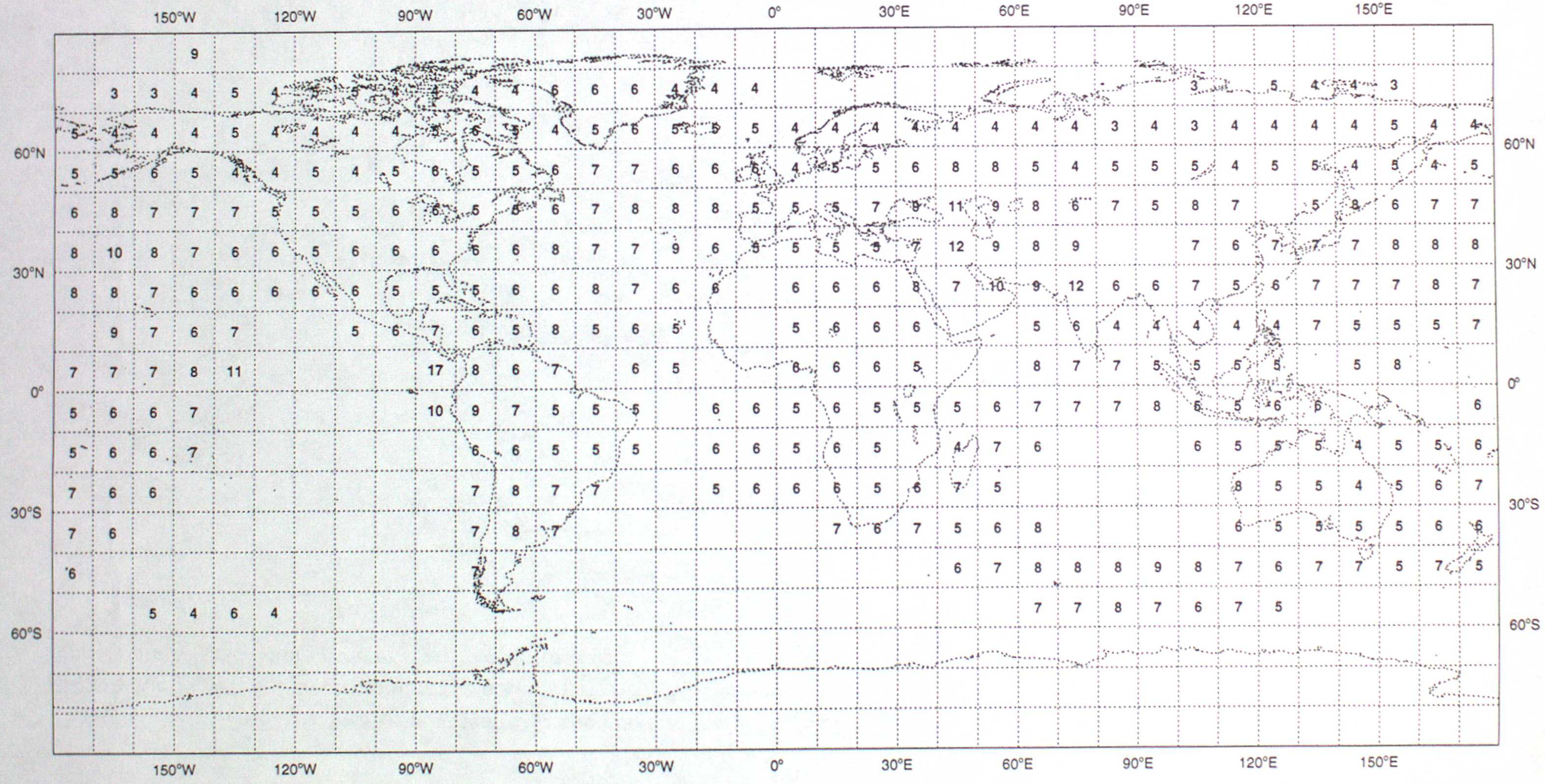
.4 .3 .5 .0 -.8 .8 .9 1.0 .8 .7 .1 .1 .2 -.5 -1.0
.2 .2 .2 1.2 .4 .2 .2 .9 .5 .7 .9 1.0 1.7 .1 .2 .2 .3 -.1 .2 -.5 -.1 2.5 .8
.9 1.1 .2 .6 .4 .3 .2 .1 1.7 .5 .9 -.1 .6 1.3 .4 .1 .8 .8 .8 -.5 1.2 -4.7 1.5 .0 1.4 -1.8 .6 -.3
-.4 .5 .1 .3 .3 .3 .1 .1 .0 -1.5 -.5 .5 .5 .1 .2 .1 .3 .4 8.2 -.2 .7 .0 -.6 .3 -.3 -1.3
1.2 -.1 1.0 -.5 .0 1.4 .8 .2 .4 .4 .1 .7 -.1 -1.5 1.9 .9 4.3 4.2 .8 .4 1.0 .6 1.3
-.3 -1.0 .6 1.0 .4 .2 .1 -.3 -.1 -.1 1.9 1.4 2.8 1.2 .6 .4 .6 1.5 -.5
3.9 .4 1.5 .2 1.5 .9 -.6 .3 1.2
1.3 .3 -.6 .6 .3 .8 .5
1.5 -.3 .5 .7 .1 .8 -.1 .6 -2.8
.7 .4 .6 2.1 .3 .3 .2 .3 .3 -.9 -.1
1.8 -2.8 3.3 .4 .6 .4 -.3 .3 .3 .4 .8 .0
.2 -.5 .3

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). APRIL 2001

Observations with O-B vector difference greater than 60 ms-1 excluded

Values are printed where greater than 30 obs are present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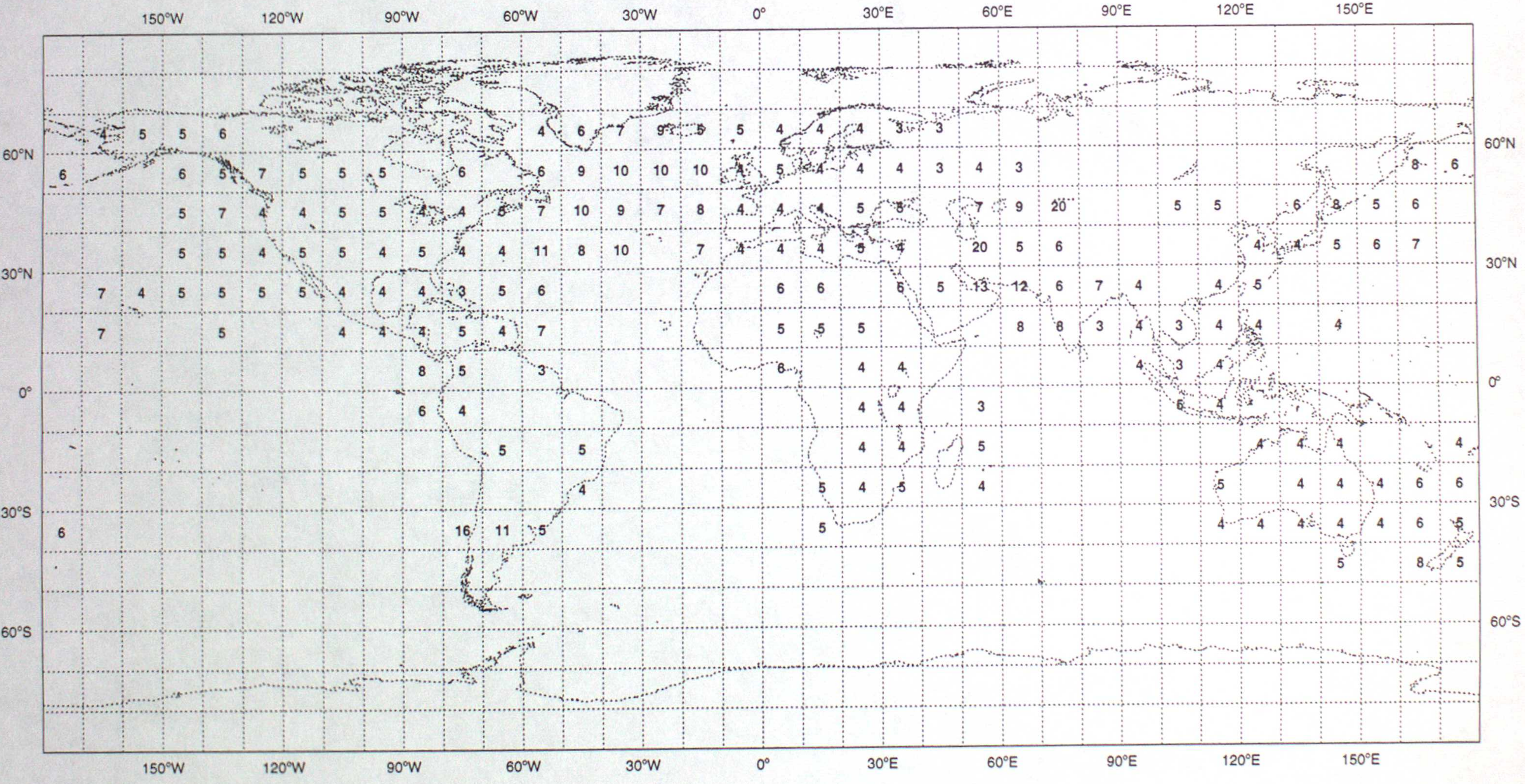
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). APRIL 2001
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present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120°E
150°E
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30°N
0°
30°S
60°S
4 5 5 6 4 6 7 9 5 5 4 4 4 3 3
6 6 5 7 5 5 5 6 6 9 10 10 10 4 5 4 4 4 3 4 3 8 6
5 7 4 4 5 5 4 4 6 7 10 9 7 8 4 4 4 5 8 7 9 20 5 5 6 8 5 6
5 5 4 5 5 4 5 4 4 11 8 10 7 4 4 4 5 4 20 5 6 4 4 5 6 7
7 4 5 5 5 5 4 4 4 3 5 6 6 6 6 5 13 12 6 7 4 4 5
7 5 4 4 4 5 4 7 5 5 5 8 8 3 4 3 4 4 4
8 5 3 6 4 4 4 3 4
6 4 4 4 3 6 4
5 5 4 4 5 4 4 4 4
4 5 4 5 4 5 4 4 4 6 6
6 16 11 5 5 4 4 4 4 4 6 5
5 8 5

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 30.0 hPa

Element monitored :GEOPOTENTIAL HEIGHT IN metres

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown duringperiod.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:SD :SD of difference of observations from background values at level shown excluding those with gross errors.

:BIAS :Mean difference of observations from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.1

SELECTION CRITERIA : ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.

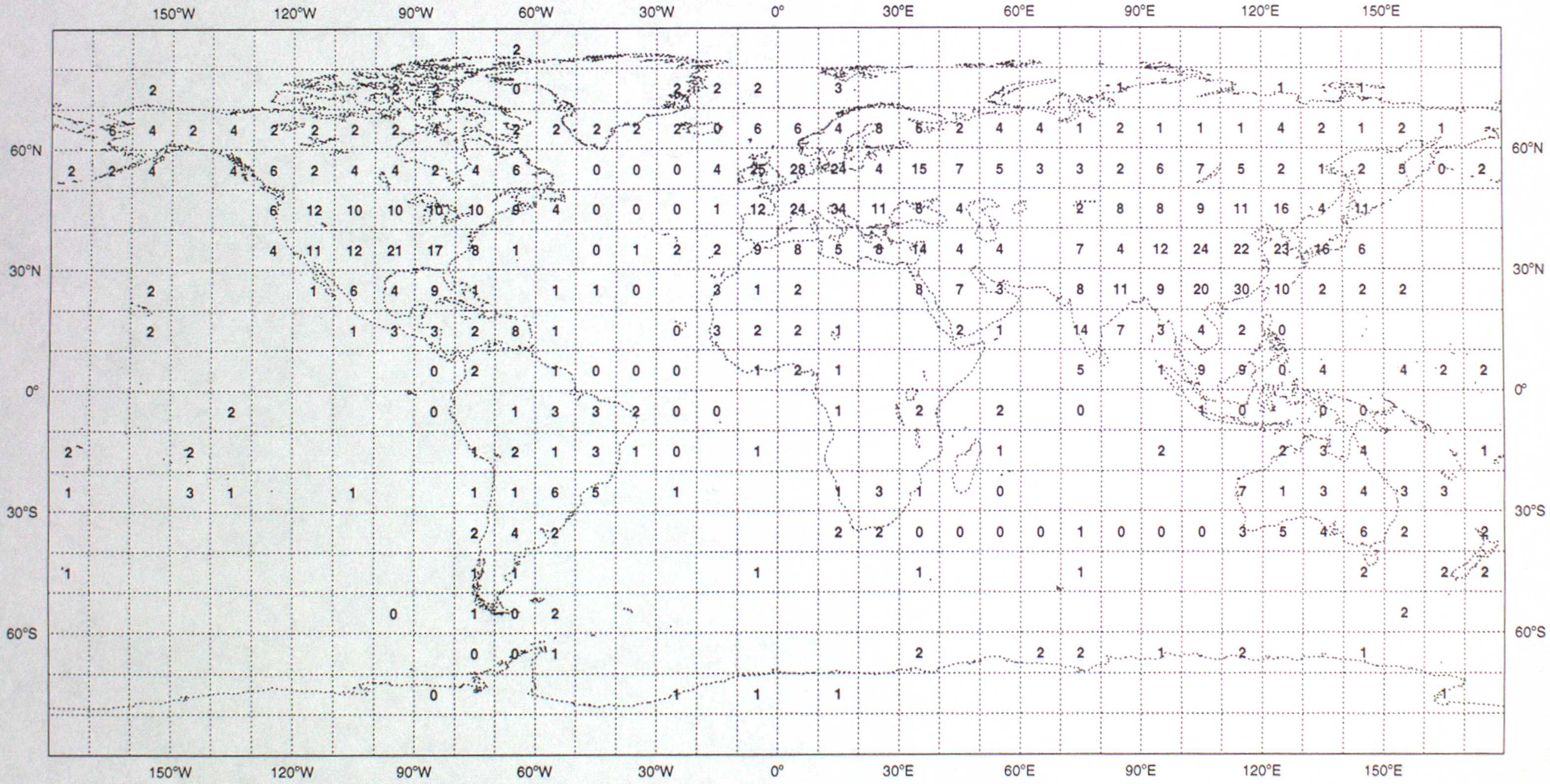
ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
22820	00	Z	150	62/ 34	13	0	77.1	98.6	125.2	6
23933	00	Z	30	61/ 69	19	2	64.8	291.5	298.6	6
28722	00	Z	30	55/ 56	13	1	166.3	200.9	260.8	6
28722	12	Z	70	55/ 56	25	0	79.2	180.8	197.4	6
32098	00	Z	150	49/ 143	28	0	47.2	118.5	127.5	4
42027	00	Z	250	34/ 75	20	3	78.4	-68.8	104.3	7
42027	12	Z	1000	34/ 75	19	0	29.0	-36.4	46.6	6
42101	12	Z	30	30/ 76	16	1	106.9	295.4	314.1	8
42182	00	Z	100	29/ 77	25	0	81.0	-77.8	112.3	4
42339	00	Z	200	26/ 73	10	1	57.9	-56.2	80.7	4
42339	12	Z	150	26/ 73	13	0	118.7	10.5	119.2	6
42361	00	Z	70	26/ 78	15	0	142.0	148.1	205.2	8
42361	12	Z	70	26/ 78	10	0	140.1	78.8	160.8	8
42397	00	Z	200	27/ 88	22	0	60.3	-74.7	96.0	6
42397	12	Z	70	27/ 88	12	1	120.0	78.1	143.2	5
42667	12	Z	30	23/ 77	10	0	133.8	233.1	268.8	7
42724	12	Z	250	24/ 91	19	1	71.8	-42.4	83.4	5
42867	00	Z	30	21/ 79	13	0	131.6	139.8	192.0	5
42867	12	Z	50	21/ 79	13	0	101.5	153.1	183.7	6
42971	00	Z	50	20/ 86	22	2	113.0	211.6	239.9	8
42971	12	Z	70	20/ 86	18	0	90.9	164.0	187.5	7
43003	00	Z	150	19/ 73	12	4	78.9	129.2	151.4	6
43003	12	Z	70	19/ 73	1	9	0.0	261.0	261.0	9
43041	00	Z	70	19/ 82	11	0	142.7	64.0	156.4	5
43041	12	Z	300	19/ 82	20	0	58.2	44.8	73.5	4
43128	00	Z	150	17/ 78	27	0	73.0	-121.9	142.1	7
43128	12	Z	50	17/ 78	20	1	94.8	184.5	207.5	4
43185	00	Z	250	16/ 81	23	0	78.0	1.4	78.0	5
43185	12	Z	150	16/ 81	16	0	138.5	37.1	143.3	5
43279	00	Z	150	13/ 80	22	0	72.0	-75.2	104.1	4
43285	12	Z	70	13/ 75	10	0	102.6	185.1	211.6	9
43295	12	Z	50	13/ 78	21	0	79.3	199.4	214.6	4
43369	12	Z	50	8/ 73	17	0	93.2	201.0	221.6	8
43371	12	Z	50	8/ 77	17	2	116.2	190.2	222.8	7
47185	00	Z	30	33/ 126	27	0	51.3	232.6	238.2	4
53463	00	Z	200	41/ 112	25	2	67.8	80.9	105.5	8
57516	12	Z	50	30/ 106	11	0	97.1	121.7	155.7	4
62378	12	Z	50	30/ 31	10	1	26.4	153.5	155.8	4
83840	12	Z	30	-26/ -49	2	0	0.5	211.5	211.5	5
84628	12	Z	850	-12/ -77	14	0	5.9	-69.7	70.0	8
91366	00	Z	50	9/ 168	21	2	55.2	291.4	296.6	8

Figure 8. TEMP 500 hPa geopotential mean daily count. APRIL 2001

All hours

Global average number of observations in 24 hours = 1184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60°S

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : $\geq$ 10 observations and $\geq$ 15 m s^{-1} RMS vector wind.

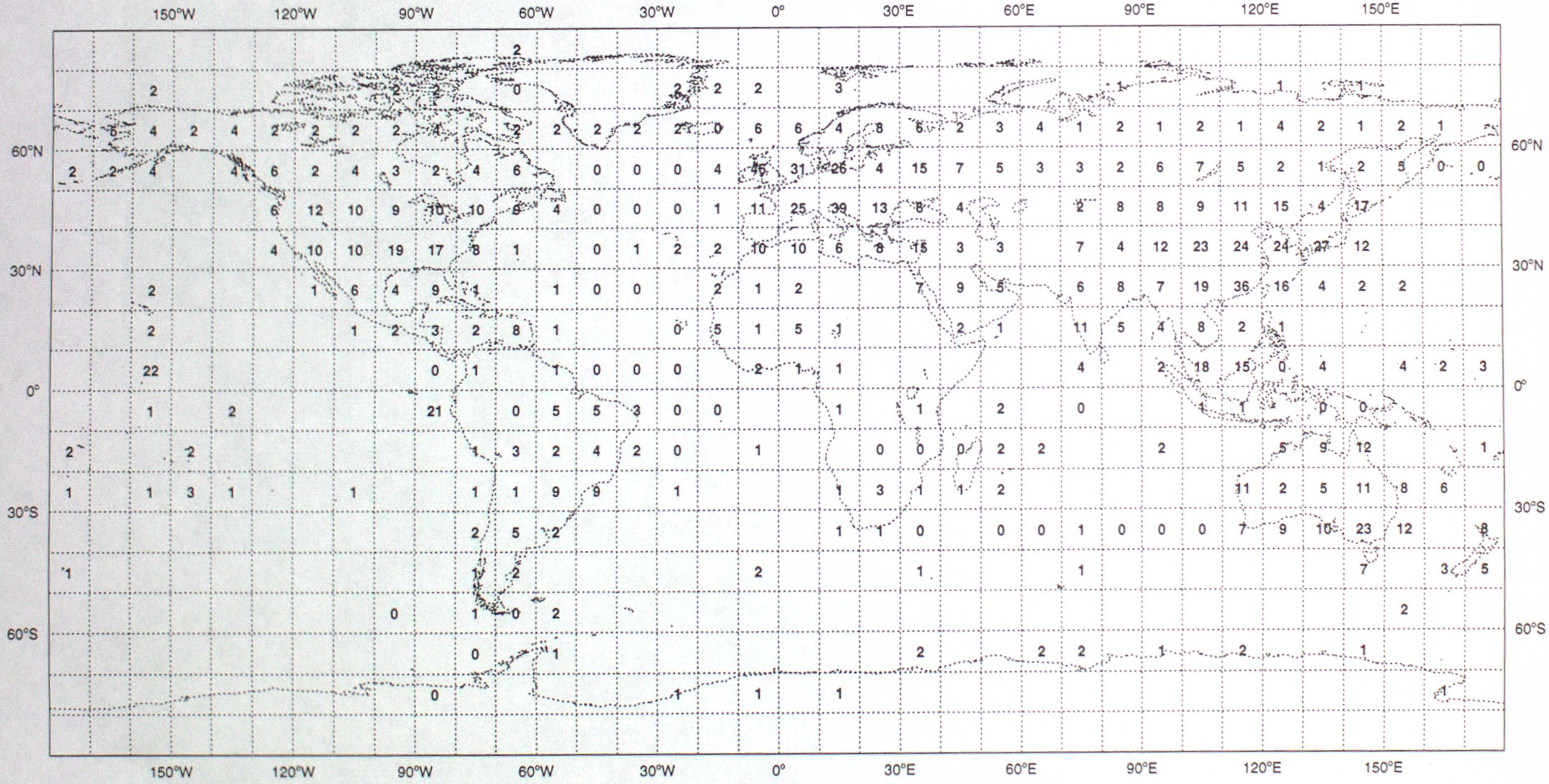
ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
PSPIU	00	V	100	-5/ -81	30	0	100	-8.9	-4.7	23.4	3
PSPIU	12	V	100	-5/ -81	29	0	100	-9.7	-4.6	24.7	3
17220	00	V	250	38/ 27	28	0	3	-3.1	-0.1	16.7	2
17351	00	V	300	37/ 35	27	0	100	-4.3	-4.9	15.5	1
40375	00	V	200	28/ 37	26	1	100	-5.6	3.7	15.3	1
40754	12	V	100	36/ 51	18	1	11	-5.8	3.1	21.3	1
41977	12	V	500	22/ 92	11	0	100	-13.6	-3.7	15.6	1
42182	12	V	200	29/ 77	19	0	100	4.4	-2.4	16.6	1
42369	00	V	200	27/ 81	20	0	95	-16.8	-1.8	19.7	2
42379	00	V	150	27/ 83	10	0	100	-7.4	4.9	39.8	2
42397	00	V	150	27/ 88	12	0	100	-6.2	-5.7	15.4	1
42397	12	V	250	27/ 88	20	0	100	-8.4	-6.1	16.1	1
42410	00	V	300	26/ 92	10	0	100	-8.9	-3.7	25.6	1
42492	12	V	250	26/ 85	13	0	38	10.5	-2.0	15.6	1
42667	12	V	300	23/ 77	18	0	38	-0.3	3.0	16.9	1
42724	00	V	300	24/ 91	15	0	100	0.7	-1.9	15.4	1
54161	12	V	200	44/ 125	30	0	100	0.4	-7.8	15.8	1
56691	12	V	150	27/ 104	19	0	100	-2.0	3.9	16.1	1
60620	12	V	250	28/ 0	10	0	100	-23.1	-6.3	31.9	3
62337	00	V	200	31/ 34	28	1	100	-7.2	12.6	17.6	3
62337	12	V	200	31/ 34	29	0	100	-6.1	15.9	20.6	4
68512	12	V	100	-30/ 18	10	0	30	12.3	2.7	17.8	1
87623	12	V	150	-37/ -64	22	0	9	-9.4	0.4	35.6	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. APRIL 2001

All hours

Global average number of observations in 24 hours = 1422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60°N 30°N 0° 30°S 60°S
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6 4 2 4 2 2 2 2 4 2 2 2 2 2 0 6 6 4 8 6 2 3 4 1 2 1 2 1 4 2 1 2 1
2 2 4 4 6 2 4 3 2 4 6 0 0 0 4 16 31 26 4 15 7 5 3 3 2 6 7 5 2 1 2 5 0 0
6 12 10 9 10 10 9 4 0 0 0 1 11 25 39 13 8 4 2 8 8 9 11 15 4 17
4 10 10 19 17 8 1 0 1 2 2 10 10 6 8 15 3 3 7 4 12 23 24 24 27 12
2 1 6 4 9 1 1 0 0 2 1 2 7 9 5 6 8 7 19 36 16 4 2 2
2 1 2 3 2 8 1 0 5 1 5 1 2 1 11 5 4 8 2 1
22 0 1 1 0 0 0 2 1 1 4 2 18 15 0 4 4 2 3
1 2 21 0 5 5 3 0 0 1 1 2 0 1 1 4 0 0
2 2 1 3 2 4 2 0 1 0 0 0 2 2 2 5 9 12 1
1 1 3 1 1 1 1 9 9 1 1 3 1 1 2 11 2 5 11 8 6
2 5 2 1 1 0 0 0 1 0 0 0 7 9 10 23 12 8
1 1 2 2 1 1 7 3 5
0 1 0 2 2
0 1 2 2 2 1 2 1
0 1 1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS $\geq 10°$, with
SD $< 30°$, and
MAX SPREAD $< 10°$

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
10828	00	DD	48/ 9	7	12.4	5.4	8.6
17280	00	DD	38/ 40	24	-10.9	2.7	9.8
17280	12	DD	38/ 40	26	-11.3	5.1	11.5
29612	12	DD	55/ 78	26	22.2	2.2	6.1
42397	12	DD	27/ 88	18	11.9	7.7	11.6
43369	12	DD	8/ 73	15	20.7	9.1	29.3
48565	00	DD	8/ 98	21	10.8	6.4	18.4
54161	00	DD	44/ 125	28	15.5	9.6	15.8
57749	12	DD	28/ 110	29	10.7	2.7	7.0
60656	12	DD	28/ -8	15	10.6	6.0	23.8
62337	00	DD	31/ 34	28	-22.5	9.1	11.8
62337	12	DD	31/ 34	28	-24.4	2.9	8.3
78486	12	DD	18/ -70	19	13.2	6.1	12.7
78988	12	DD	12/ -69	20	11.3	7.4	16.4
80001	12	DD	13/ -82	23	10.4	7.0	21.3
96413	12	DD	1/ 110	18	11.6	7.1	19.3

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: April 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

:Mean wind

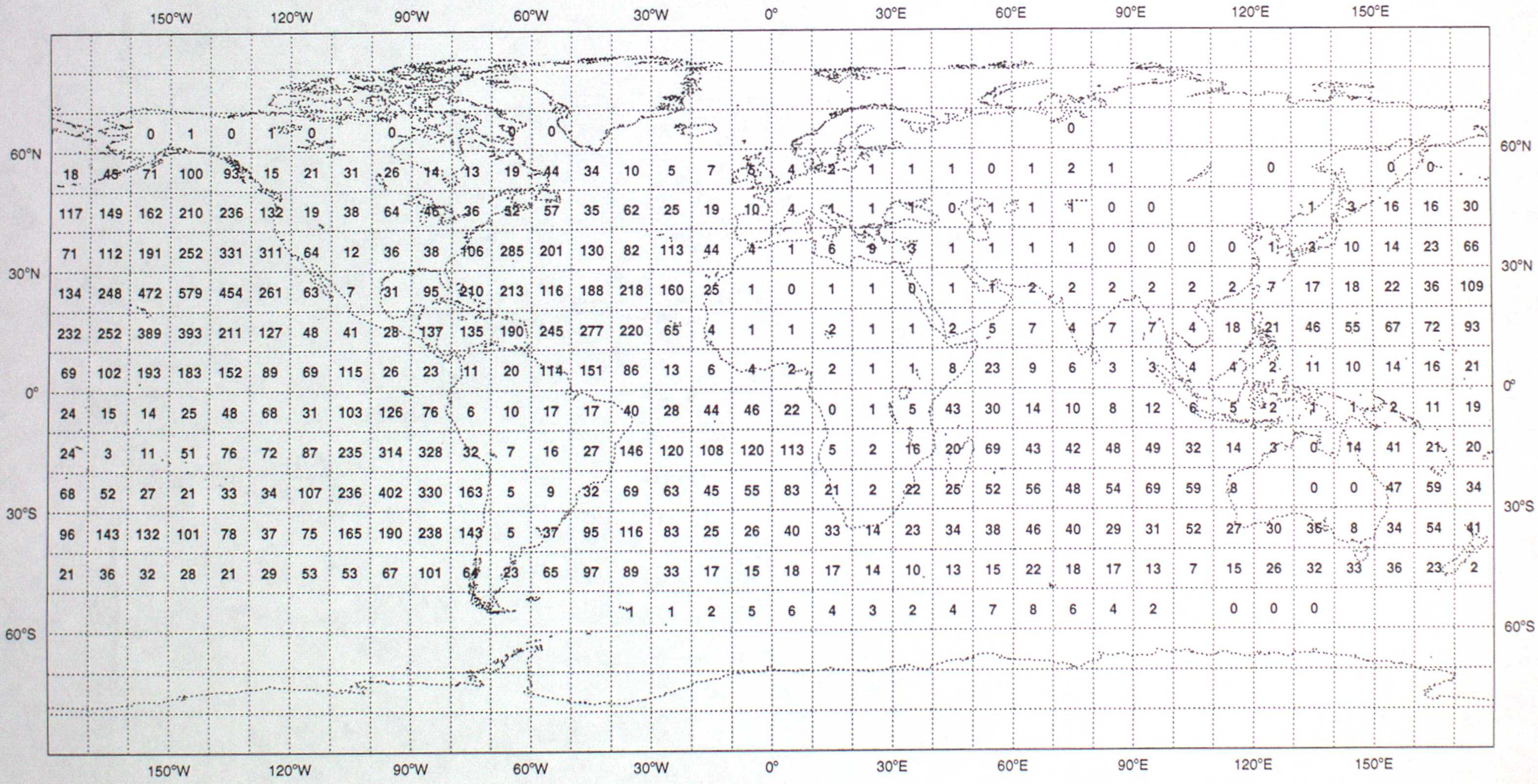
:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. APRIL 2001

Global average number of observations in 24 hours = 22602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90°E
120°E
150°E
60°N
30°N
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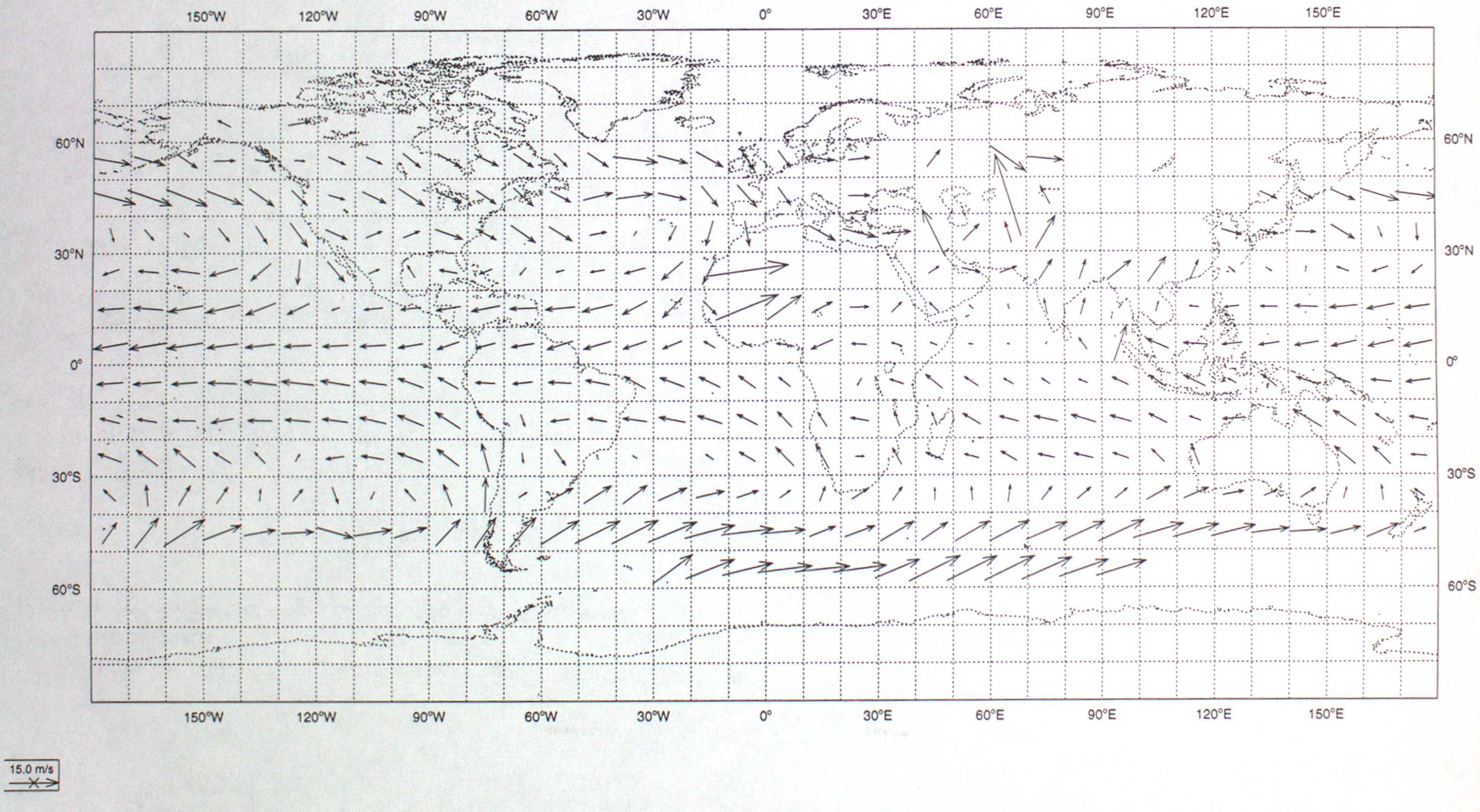
30°S
60°S
0 1 0 1 0 0 0 0 0
18 45 71 100 93 15 21 31 26 14 13 19 44 34 10 5 7 5 4 2 1 1 1 0 1 2 1 0 0 0
117 149 162 210 236 132 19 38 64 46 36 52 57 35 62 25 19 10 4 1 1 1 0 1 1 1 0 0 1 3 16 16 30
71 112 191 252 331 311 64 12 36 38 106 285 201 130 82 113 44 4 1 6 9 3 1 1 1 1 0 0 0 0 1 2 10 14 23 66
134 248 472 579 454 261 63 7 31 95 210 213 116 188 218 160 25 1 0 1 1 0 1 1 2 2 2 2 2 2 7 17 18 22 36 109
232 252 389 393 211 127 48 41 28 137 135 190 245 277 220 65 4 1 1 2 1 1 2 5 7 4 7 7 4 18 21 46 55 67 72 93
69 102 193 183 152 89 69 115 26 23 11 20 114 151 86 13 6 4 2 2 1 1 8 23 9 6 3 3 4 4 2 11 10 14 16 21
24 15 14 25 48 68 31 103 126 76 6 10 17 17 40 28 44 46 22 0 1 5 43 30 14 10 8 12 6 5 2 1 1 2 11 19
24 3 11 51 76 72 87 235 314 328 32 7 16 27 146 120 108 120 113 5 2 16 20 69 43 42 48 49 32 14 3 0 14 41 21 20
68 52 27 21 33 34 107 236 402 330 163 5 9 32 69 63 45 55 83 21 2 22 25 52 56 48 54 69 59 8 0 0 47 59 34
96 143 132 101 78 37 75 165 190 238 143 5 37 95 116 83 25 26 40 33 14 23 34 38 46 40 29 31 52 27 30 35 8 34 54 41
21 36 32 28 21 29 53 53 67 101 64 23 65 97 89 33 17 15 18 17 14 10 13 15 22 18 17 13 7 15 26 32 33 36 23 2
1 1 2 5 6 4 3 2 4 7 8 6 4 2 0 0 0

Figure 11. SATOB 701 - 1000 hPa vector mean wind. APRIL 2001

All observations

Arrows are plotted where greater than 10 obs are present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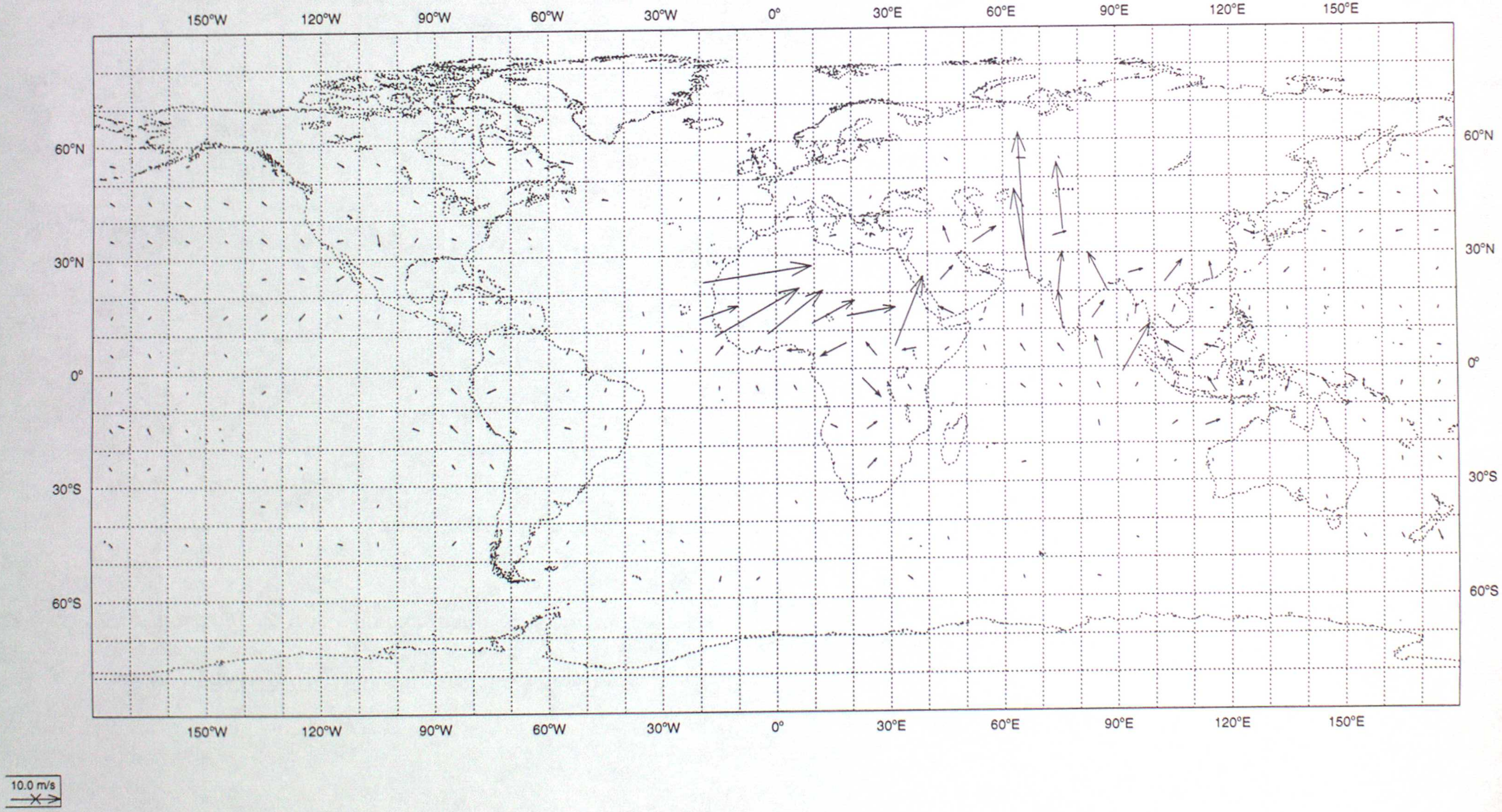
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 12. SATOB 701 - 1000 hPa vector wind differences. APRIL 2001

All observations

Arrows are plotted where greater than 10 obs are present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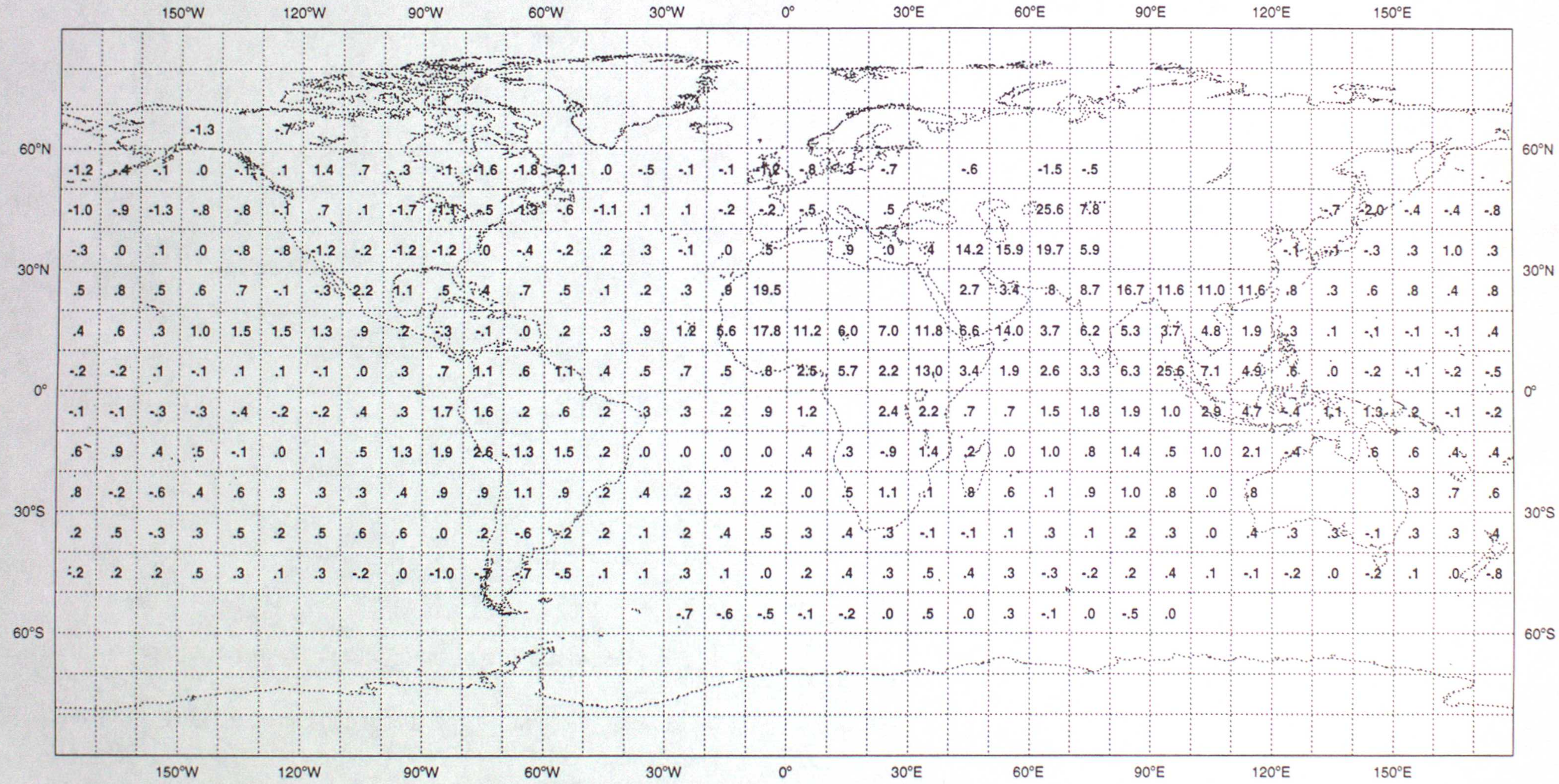
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). APRIL 2001

All observations

Values are plotted where greater than 10 obs are present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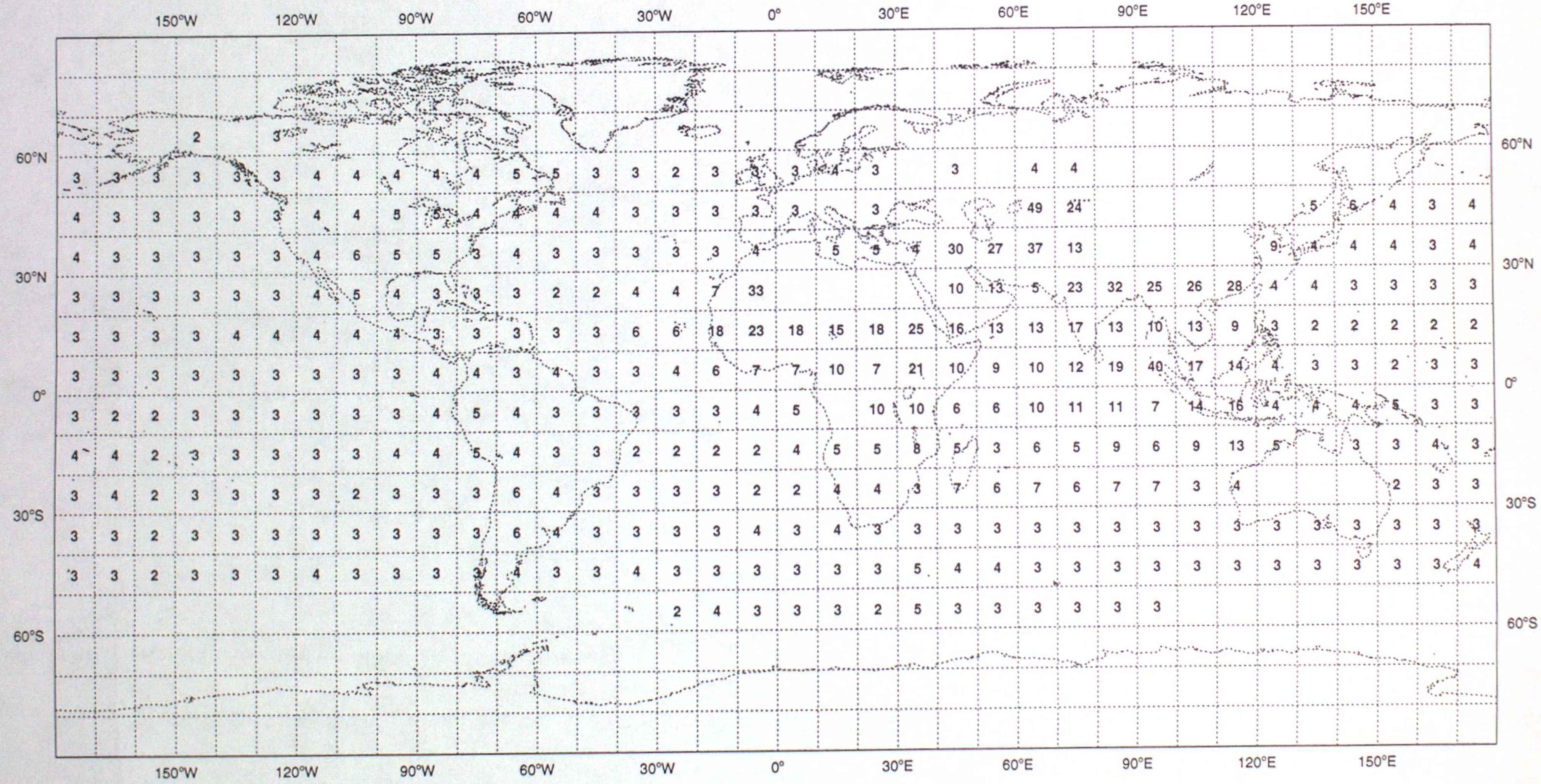
60°N
30°N
0°
30°S
60°S
-1.3 -.7
-1.2 .4 -.1 .0 -.1 .1 1.4 .7 .3 -.1 -1.6 -1.8 -2.1 .0 -.5 -.1 -.1 -1.2 -.8 -.3 -.7 -.6 -1.5 -.5
-1.0 -.9 -1.3 -.8 -.8 -.1 .7 .1 -1.7 -1.1 -.5 -1.3 -.6 -1.1 .1 .1 -.2 -.2 -.5 .5 25.6 7.8 -.7 -2.0 -.4 -.4 -.8
-.3 .0 .1 .0 -.8 -.8 -1.2 -.2 -1.2 -1.2 .0 -.4 -.2 .2 .3 -.1 .0 .5 .9 .0 .4 14.2 15.9 19.7 5.9 -.1 -.1 -.3 .3 1.0 .3
.5 .8 .5 .6 .7 -.1 -.3 2.2 1.1 .5 .4 .7 .5 .1 .2 .3 .9 19.5 2.7 3.4 .8 8.7 16.7 11.6 11.0 11.6 .8 .3 .6 .8 .4 .8
.4 .6 .3 1.0 1.5 1.5 1.3 .9 .2 -.3 -.1 .0 .2 .3 .9 1.2 5.6 17.8 11.2 6.0 7.0 11.8 6.6 14.0 3.7 6.2 5.3 3.7 4.8 1.9 .3 .1 -.1 -.1 -.1 .4
-.2 -.2 .1 -.1 .1 .1 -.1 .0 .3 .7 1.1 .6 1.1 .4 .5 .7 .5 .8 2.5 5.7 2.2 13.0 3.4 1.9 2.6 3.3 6.3 25.6 7.1 4.9 .6 .0 -.2 -.1 -.2 -.5
-.1 -.1 -.3 -.3 -.4 -.2 -.2 .4 .3 1.7 1.6 .2 .6 .2 .3 .3 .2 .9 1.2 2.4 2.2 .7 .7 1.5 1.8 1.9 1.0 2.9 4.7 -.4 1.1 1.3 .2 -.1 -.2
.6 .9 .4 .5 -.1 .0 .1 .5 1.3 1.9 2.6 1.3 1.5 .2 .0 .0 .0 .0 .4 .3 -.9 1.4 .2 .0 1.0 .8 1.4 .5 1.0 2.1 -.4 .6 .6 .4 .4
.8 -.2 -.6 .4 .6 .3 .3 .3 .4 .9 .9 1.1 .9 .2 .4 .2 .3 .2 .0 .5 1.1 .1 .8 .6 .1 .9 1.0 .8 .0 .8 .3 .7 .6
.2 .5 -.3 .3 .5 .2 .5 .6 .6 .0 .2 -.6 -.2 .2 .1 .2 .4 .5 .3 .4 .3 -.1 -.1 .1 .3 .1 .2 .3 .0 .4 .3 .3 -.1 .3 .3 .4
-.2 .2 .2 .5 .3 .1 .3 -.2 .0 -1.0 -.7 -.7 -.5 .1 .1 .3 .1 .0 .2 .4 .3 .5 .4 .3 -.3 -.2 .2 .4 .1 -.1 -.2 .0 -.2 .1 .0 -.8
-.7 -.6 -.5 -.1 -.2 .0 .5 .0 .3 -.1 .0 -.5 .0

Figure 14. SATOB 701 - 1000 hPa RMS O-B vector differences (ms-1). APRIL 2001

All observations

Values are plotted where greater than 10 obs are present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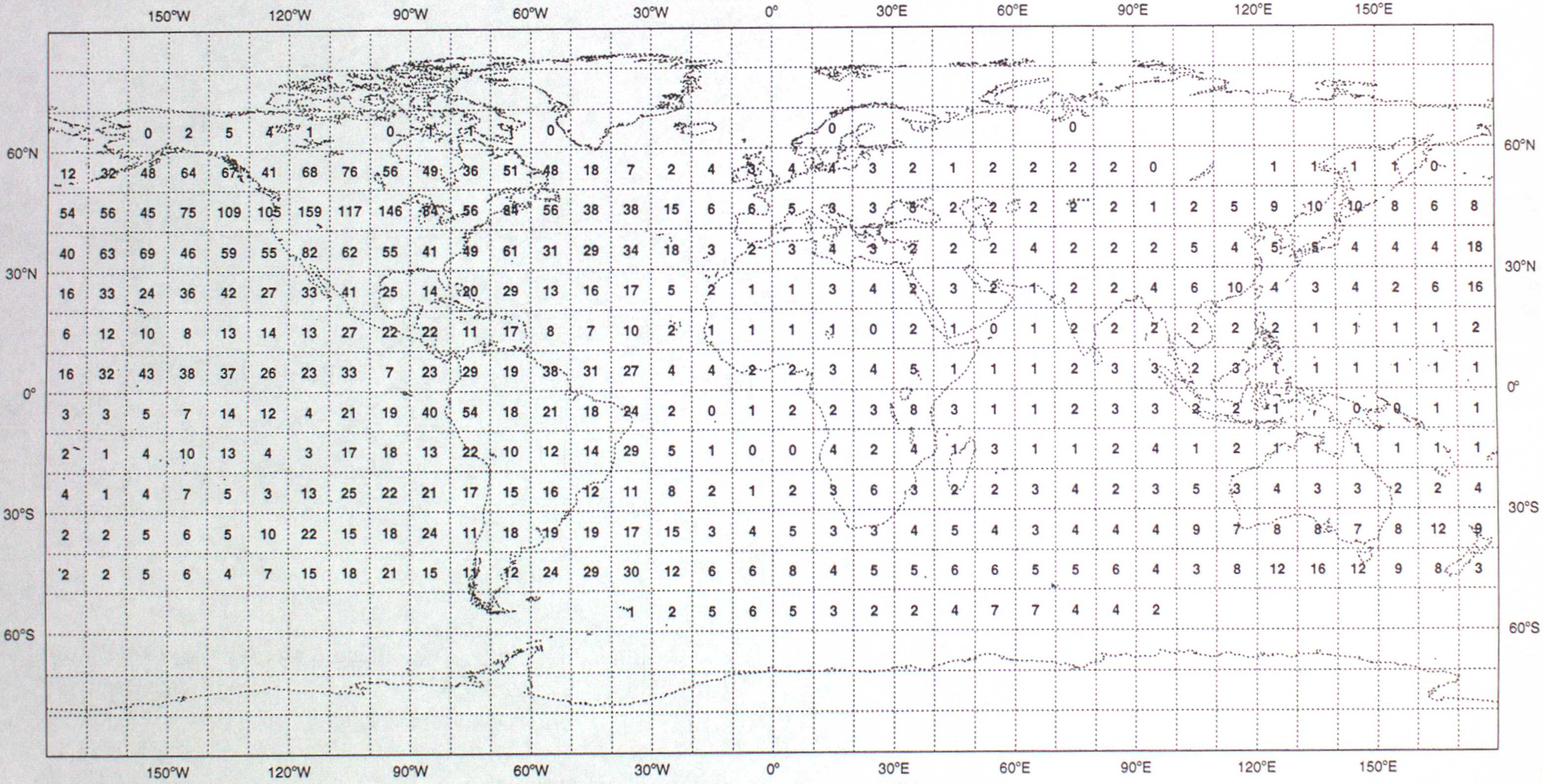
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2 3
3 3 3 3 3 3 4 4 4 4 4 5 5 3 3 2 3 3 3 4 3 3 4 4
4 3 3 3 3 3 4 4 5 5 4 4 4 4 3 3 3 3 3 3 49 24 5 6 4 3 4
4 3 3 3 3 3 4 6 5 5 3 4 3 3 3 3 3 4 5 5 4 30 27 37 13 9 4 4 4 3 4
3 3 3 3 3 3 4 5 4 3 3 3 2 2 4 4 7 33 10 13 5 23 32 25 26 28 4 4 3 3 3 3
3 3 3 3 4 4 4 4 4 3 3 3 3 3 6 6 18 23 18 15 18 25 16 13 13 17 13 10 13 9 3 2 2 2 2 2
3 3 3 3 3 3 3 3 3 4 4 3 4 3 3 4 6 7 7 10 7 21 10 9 10 12 19 40 17 14 4 3 3 2 3 3
3 2 2 3 3 3 3 3 3 4 5 4 3 3 3 3 3 4 5 10 10 6 6 10 11 11 7 14 16 4 4 4 5 3 3
4 4 2 3 3 3 3 3 4 4 5 4 3 3 2 2 2 2 4 5 5 8 5 3 6 5 9 6 9 13 5 3 3 4 3
3 4 2 3 3 3 3 2 3 3 3 6 4 3 3 3 3 2 2 4 4 3 7 6 7 6 7 7 3 4 2 3 3
3 3 2 3 3 3 3 3 3 3 3 6 4 3 3 3 3 4 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
3 3 2 3 3 3 4 3 3 3 3 4 3 3 4 3 3 3 3 3 3 5 4 4 3 3 3 3 3 3 3 3 3 3 3 4
2 4 3 3 3 2 5 3 3 3 3 3 3
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 15. SATOB 401 - 700 hPa mean daily count. APRIL 2001
Global average number of observations in 24 hours = 5575



		0	2	5	4	1		0	1	1	1	0							0						0										
12	32	48	64	67	41	68	76	56	49	36	51	48	18	7	2	4	3	4	4	3	2	1	2	2	2	2	0			1	1	1	1	0	
54	56	45	75	109	105	159	117	146	84	56	84	56	38	38	15	6	6	5	3	3	8	2	2	2	2	2	1	2	5	9	10	10	8	6	8
40	63	69	46	59	55	82	62	55	41	49	61	31	29	34	18	3	2	3	4	3	2	2	2	4	2	2	2	5	4	5	5	4	4	4	18
16	33	24	36	42	27	33	41	25	14	20	29	13	16	17	5	2	1	1	3	4	2	3	2	1	2	2	4	6	10	4	3	4	2	6	16
6	12	10	8	13	14	13	27	22	22	11	17	8	7	10	2	1	1	1	1	0	2	1	0	1	2	2	2	2	2	2	1	1	1	1	2
16	32	43	38	37	26	23	33	7	23	29	19	38	31	27	4	4	2	2	3	4	5	1	1	1	2	3	3	2	3	1	1	1	1	1	1
3	3	5	7	14	12	4	21	19	40	54	18	21	18	24	2	0	1	2	2	3	8	3	1	1	2	3	3	2	2	1		0	0	1	1
2	1	4	10	13	4	3	17	18	13	22	10	12	14	29	5	1	0	0	4	2	4	1	3	1	1	2	4	1	2	1	1	1	1	1	1
4	1	4	7	5	3	13	25	22	21	17	15	16	12	11	8	2	1	2	3	6	3	2	2	3	4	2	3	5	3	4	3	3	2	2	4
2	2	5	6	5	10	22	15	18	24	11	18	19	19	17	15	3	4	5	3	3	4	5	4	3	4	4	4	9	7	8	8	7	8	12	9
2	2	5	6	4	7	15	18	21	15	11	12	24	29	30	12	6	6	8	4	5	5	6	6	5	5	6	4	3	8	12	16	12	9	8	3
														1	2	5	6	5	3	2	2	4	7	7	4	4	2								

Figure 16. SATOB 401 - 700 hPa vector mean wind. APRIL 2001

All observations

Arrows are plotted where greater than 10 obs are present

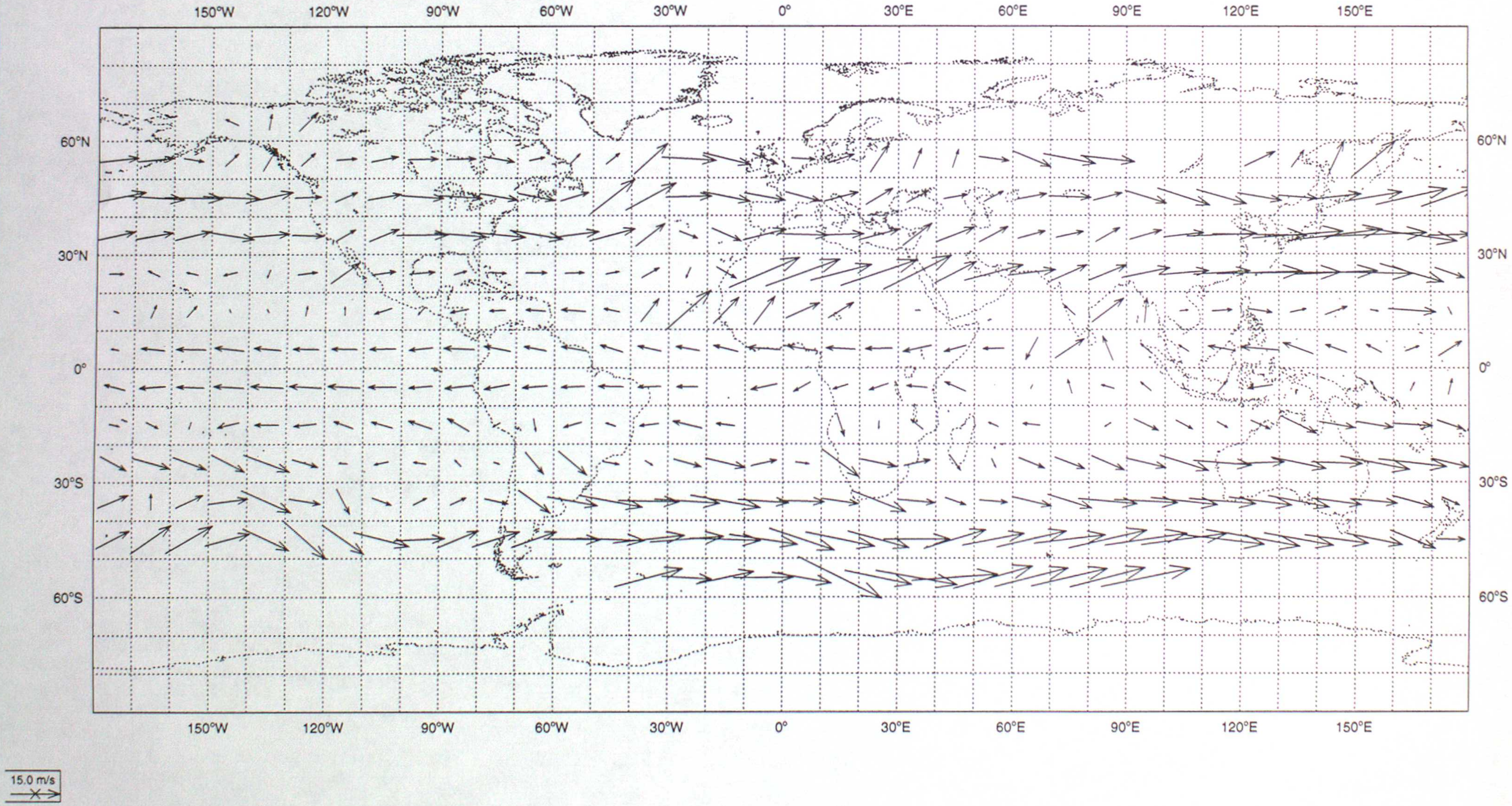

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 17. SATOB 401 - 700 hPa vector wind differences. APRIL 2001
All observations
Arrows are plotted where greater than 10 obs are present

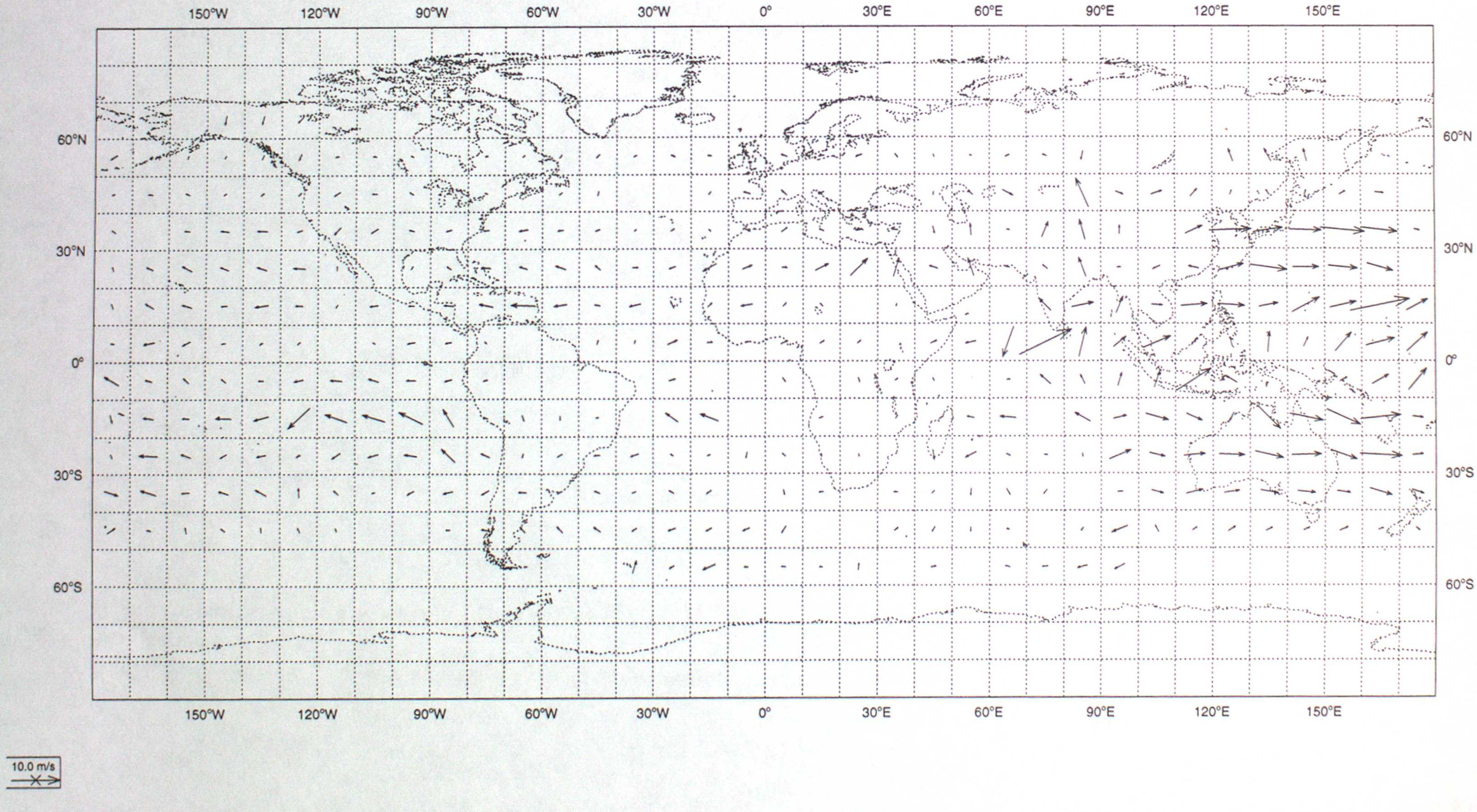

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). APRIL 2001

All observations

Values are plotted where greater than 10 obs are present

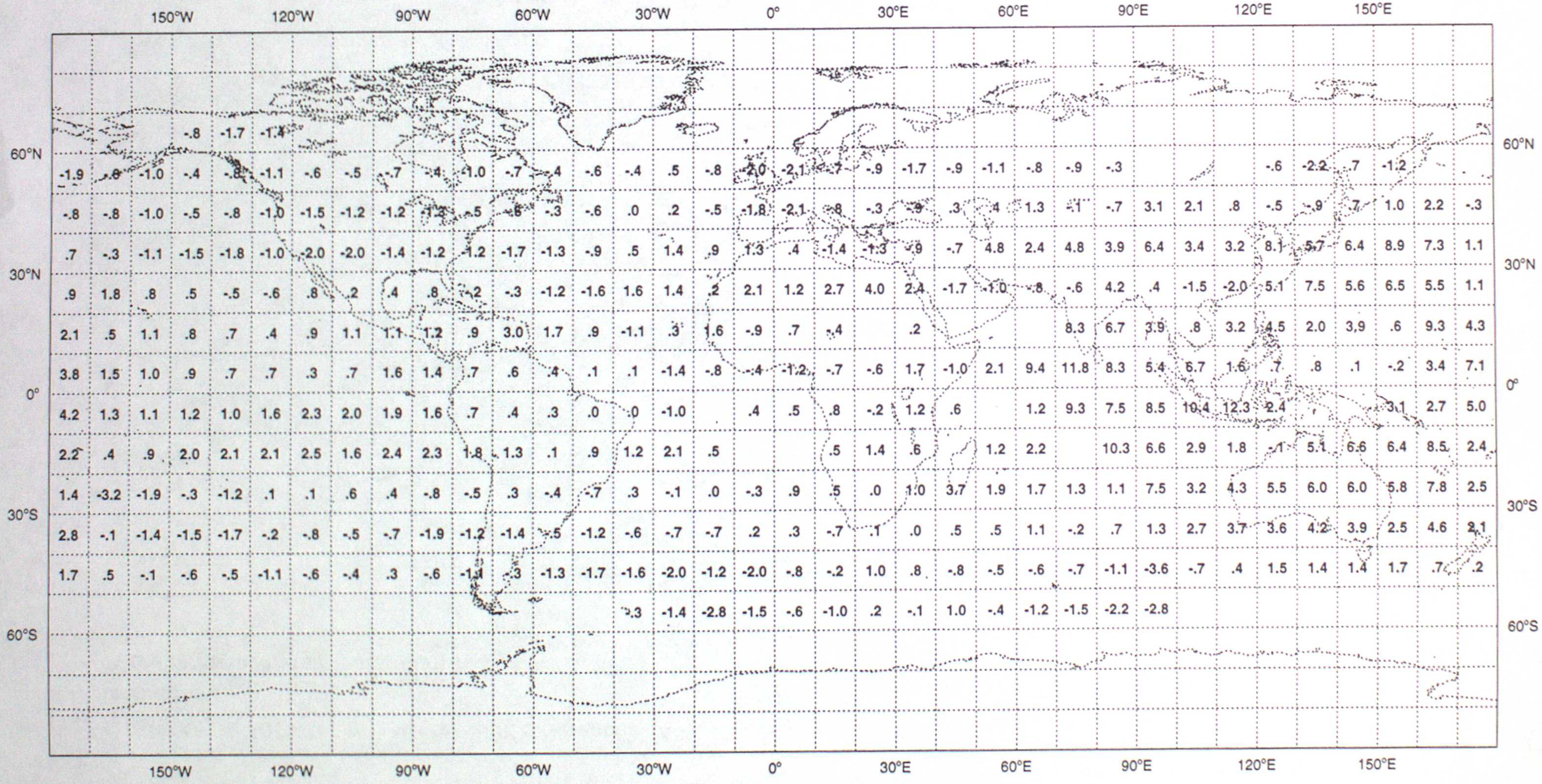

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-.8 -1.7 -1.4
-1.9 -.8 -1.0 -.4 -.8 -1.1 -.6 -.5 -.7 -.4 -1.0 -.7 -.4 -.6 -.4 .5 -.8 -2.0 -2.1 -.7 -.9 -1.7 -.9 -1.1 -.8 -.9 -.3 -.6 -2.2 .7 -1.2
-.8 -.8 -1.0 -.5 -.8 -1.0 -1.5 -1.2 -1.2 -1.3 -.5 -.8 -.3 -.6 .0 .2 -.5 -1.8 -2.1 -.8 -.3 -.9 .3 .4 1.3 -.1 -.7 3.1 2.1 .8 -.5 -.9 .7 1.0 2.2 -.3
.7 -.3 -1.1 -1.5 -1.8 -1.0 -2.0 -2.0 -1.4 -1.2 -1.2 -1.7 -1.3 -.9 .5 1.4 .9 1.3 .4 -1.4 -1.3 -.9 -.7 4.8 2.4 4.8 3.9 6.4 3.4 3.2 8.1 5.7 6.4 8.9 7.3 1.1
.9 1.8 .8 .5 -.5 -.6 .8 .2 .4 .8 -.2 -.3 -1.2 -1.6 1.6 1.4 .2 2.1 1.2 2.7 4.0 2.4 -1.7 -1.0 -.8 -.6 4.2 .4 -1.5 -2.0 5.1 7.5 5.6 6.5 5.5 1.1
2.1 .5 1.1 .8 .7 .4 .9 1.1 1.1 1.2 .9 3.0 1.7 .9 -1.1 .3 1.6 -.9 .7 -.4 .2 8.3 6.7 3.9 .8 3.2 4.5 2.0 3,9 .6 9.3 4.3
3.8 1.5 1.0 .9 .7 .7 .3 .7 1.6 1.4 .7 .6 .4 .1 .1 -1.4 -.8 -.4 -1.2 -.7 -.6 1.7 -1.0 2.1 9.4 11.8 8.3 5.4 6.7 1.6 .7 .8 .1 -.2 3.4 7.1
4.2 1.3 1.1 1.2 1.0 1.6 2.3 2.0 1.9 1.6 .7 .4 .3 .0 .0 -1.0 .4 .5 .8 -.2 1.2 .6 1.2 9.3 7.5 8.5 10.4 12.3 2.4 3.1 2.7 5.0
2.2 .4 .9 2.0 2.1 2.1 2.5 1.6 2.4 2.3 1.8 1.3 .1 .9 1.2 2.1 .5 .5 1.4 .6 1.2 2.2 10.3 6.6 2.9 1.8 -.1 5.1 6.6 6.4 8.5 2.4
1.4 -3.2 -1.9 -.3 -1.2 .1 .1 .6 .4 -.8 -.5 .3 -.4 -.7 .3 -.1 .0 -.3 .9 .5 .0 1.0 3.7 1.9 1.7 1.3 1.1 7.5 3.2 4.3 5.5 6.0 6.0 5.8 7.8 2.5
2.8 -.1 -1.4 -1.5 -1.7 -.2 -.8 -.5 -.7 -1.9 -1.2 -1.4 -.5 -1.2 -.6 -.7 -.7 .2 .3 -.7 .1 .0 .5 .5 1.1 -.2 .7 1.3 2.7 3.7 3.6 4.2 3.9 2.5 4.6 2.1
1.7 .5 -.1 -.6 -.5 -1.1 -.6 -.4 .3 -.6 -1.1 -.3 -1.3 -1.7 -1.6 -2.0 -1.2 -2.0 -.8 -.2 1.0 .8 -.8 -.5 -.6 -.7 -1.1 -3.6 -.7 .4 1.5 1.4 1.4 1.7 .7 .2
-.3 -1.4 -2.8 -1.5 -.6 -1.0 .2 -.1 1.0 -.4 -1.2 -1.5 -2.2 -2.8

Figure 19. SATOB 401 - 700 hPa RMS O-B vector differences (ms-1). APRIL 2001

All observations

Values are plotted where greater than 10 obs are present

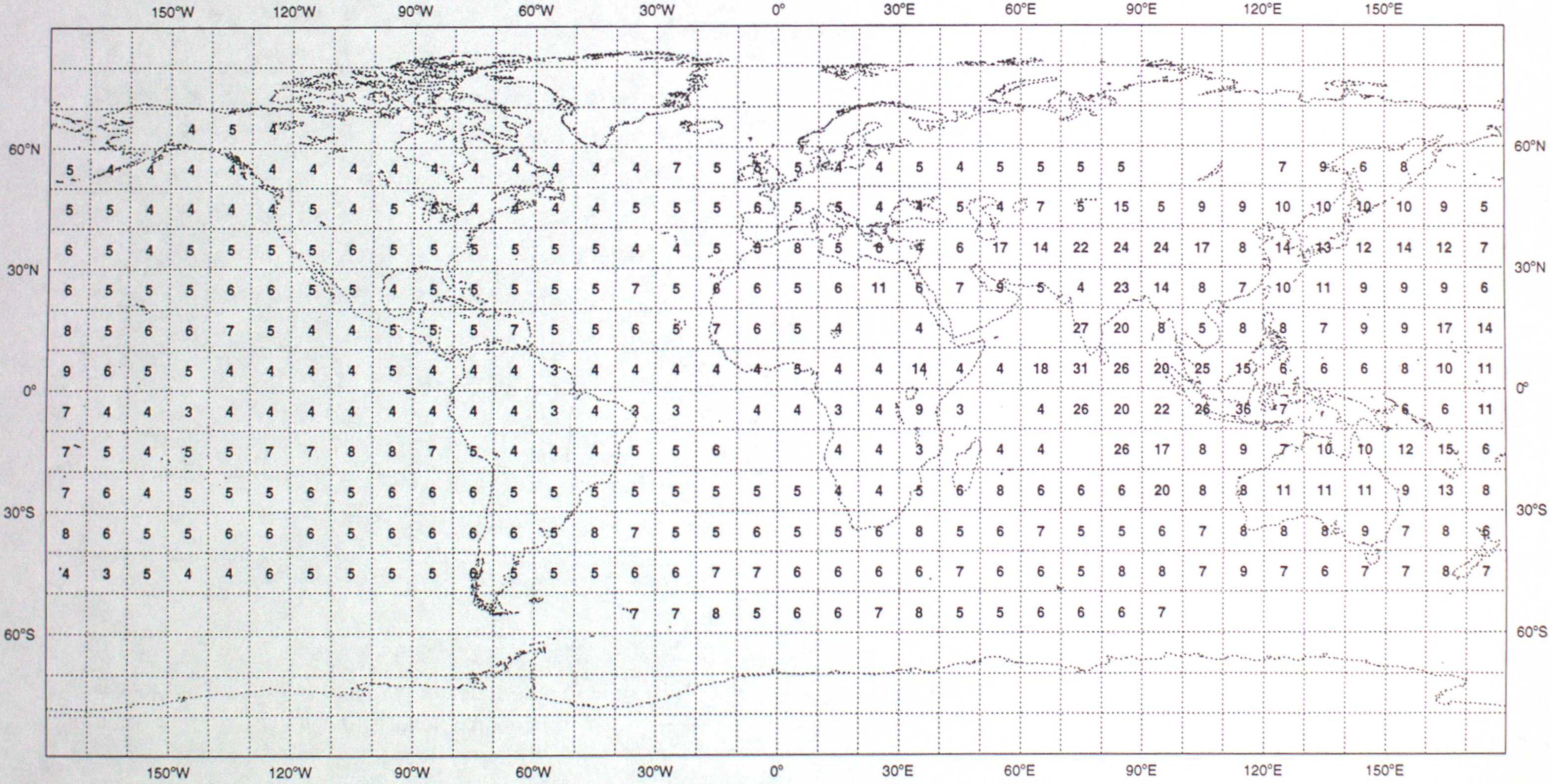
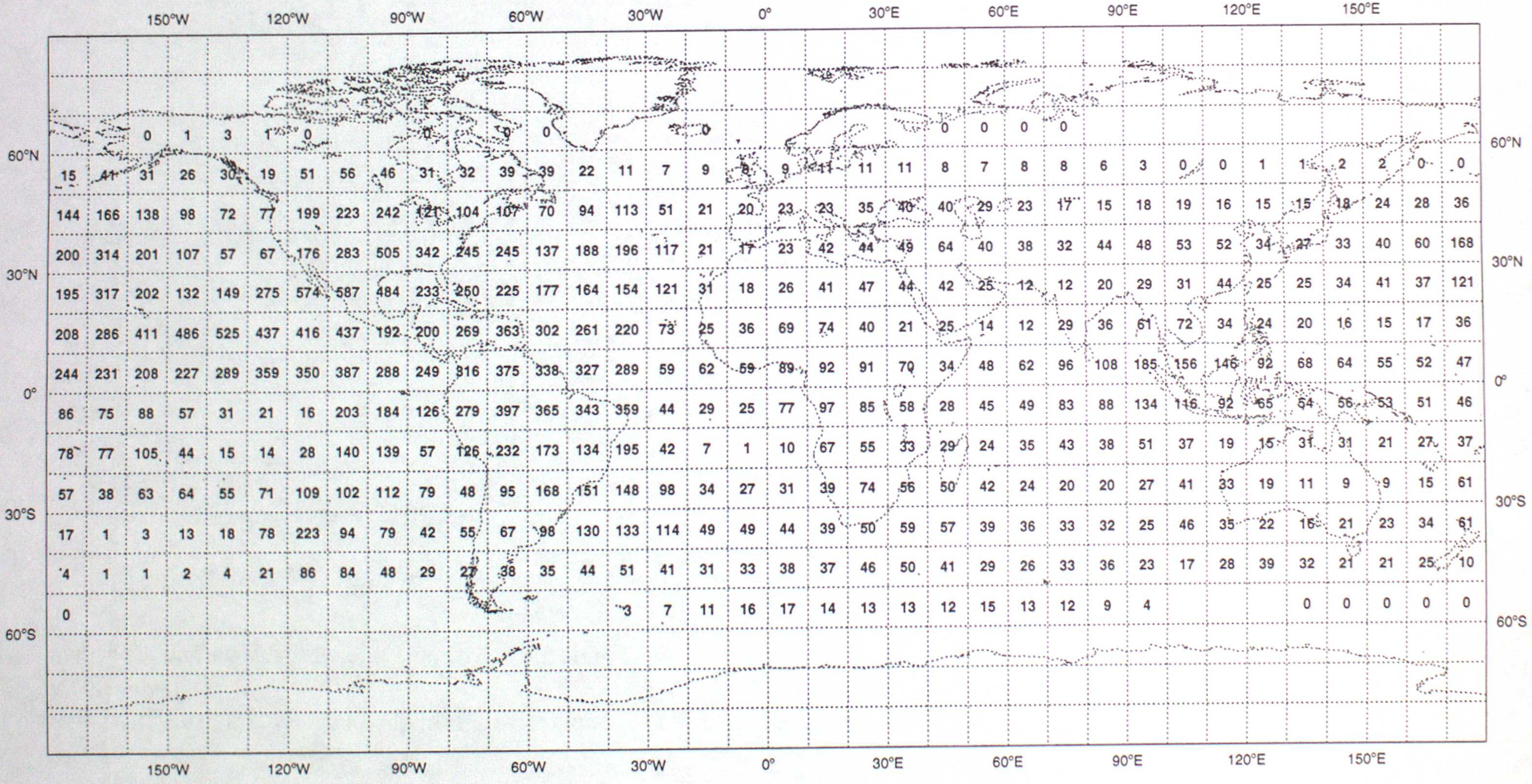

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 20. SATOB 101 - 400 hPa mean daily count. APRIL 2001
Global average number of observations in 24 hours = 35869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60°N 30°N 0° 30°S 60°S
0 1 3 1 0 0 0 0 0 0 0 0 0
15 41 31 26 30 19 51 56 46 31 32 39 39 22 11 7 9 8 9 11 11 11 8 7 8 8 6 3 0 0 1 1 2 2 0 0
144 166 138 98 72 77 199 223 242 121 104 107 70 94 113 51 21 20 23 23 35 40 40 29 23 17 15 18 19 16 15 15 18 24 28 36
200 314 201 107 57 67 176 283 505 342 245 245 137 188 196 117 21 17 23 42 44 49 64 40 38 32 44 48 53 52 34 27 33 40 60 168
195 317 202 132 149 275 574 587 484 233 250 225 177 164 154 121 31 18 26 41 47 44 42 25 12 12 20 29 31 44 25 25 34 41 37 121
208 286 411 486 525 437 416 437 192 200 269 363 302 261 220 73 25 36 69 74 40 21 25 14 12 29 36 61 72 34 24 20 16 15 17 36
244 231 208 227 289 359 350 387 288 249 316 375 338 327 289 59 62 59 89 92 91 70 34 48 62 96 108 185 156 146 92 68 64 55 52 47
86 75 88 57 31 21 16 203 184 126 279 397 365 343 359 44 29 25 77 97 85 58 28 45 49 83 88 134 116 92 65 54 56 53 51 46
78 77 105 44 15 14 28 140 139 57 126 232 173 134 195 42 7 1 10 67 55 33 29 24 35 43 38 51 37 19 15 31 31 21 27 37
57 38 63 64 55 71 109 102 112 79 48 95 168 151 148 98 34 27 31 39 74 56 50 42 24 20 20 27 41 33 19 11 9 9 15 61
17 1 3 13 18 78 223 94 79 42 55 67 98 130 133 114 49 49 44 39 50 59 57 39 36 33 32 25 46 35 22 16 21 23 34 61
4 1 1 2 4 21 86 84 48 29 27 38 35 44 51 41 31 33 38 37 46 50 41 29 26 33 36 23 17 28 39 32 21 21 25 10
0 3 7 11 16 17 14 13 13 12 15 13 12 9 4 0 0 0 0 0
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 21. SATOB 101 - 400 hPa vector mean wind. APRIL 2001

All observations

Arrows are plotted where greater than 10 obs are present

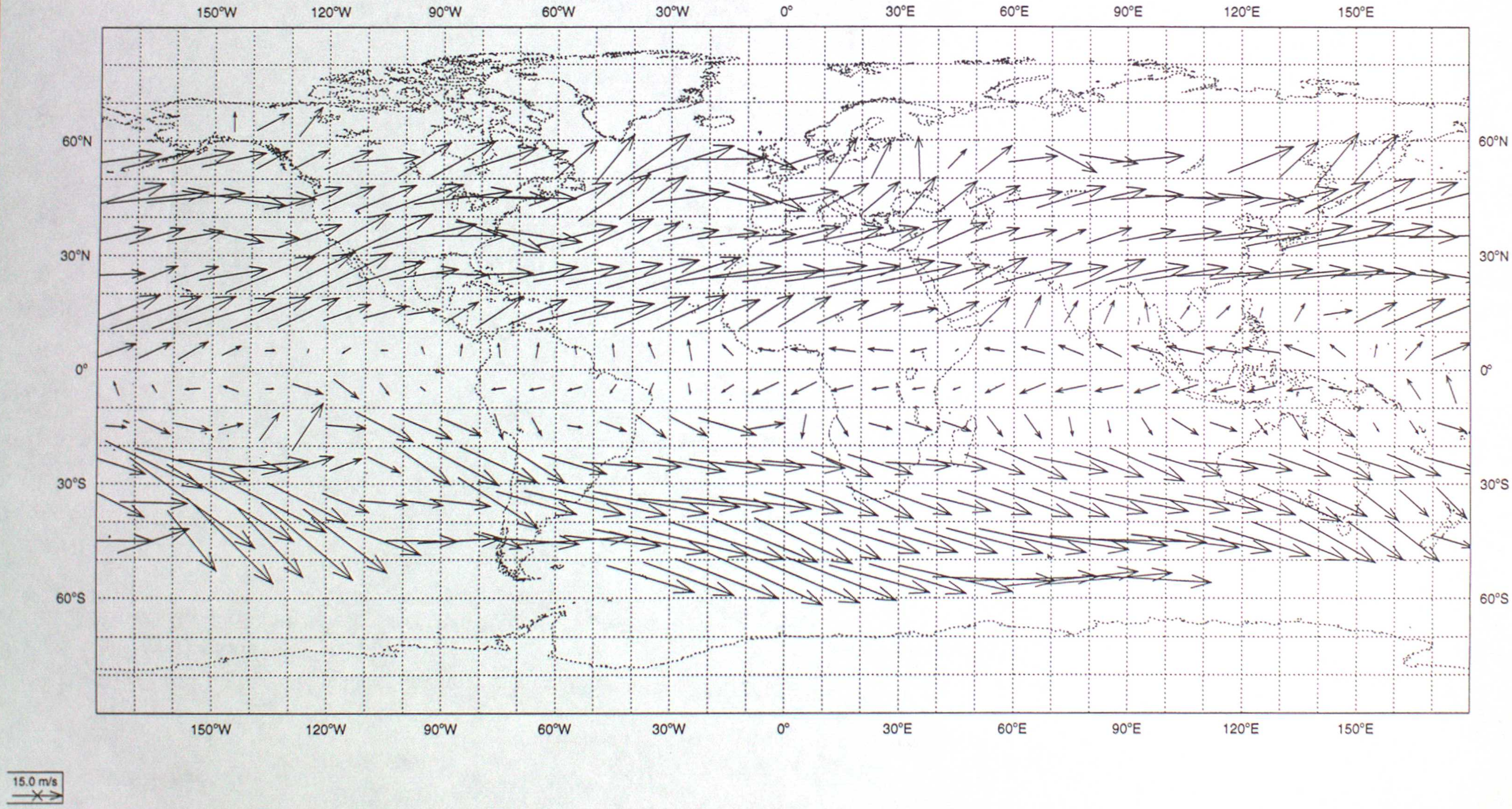

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 22. SATOB 101 - 400 hPa vector wind differences. APRIL 2001

All observations

Arrows are plotted where greater than 10 obs are present

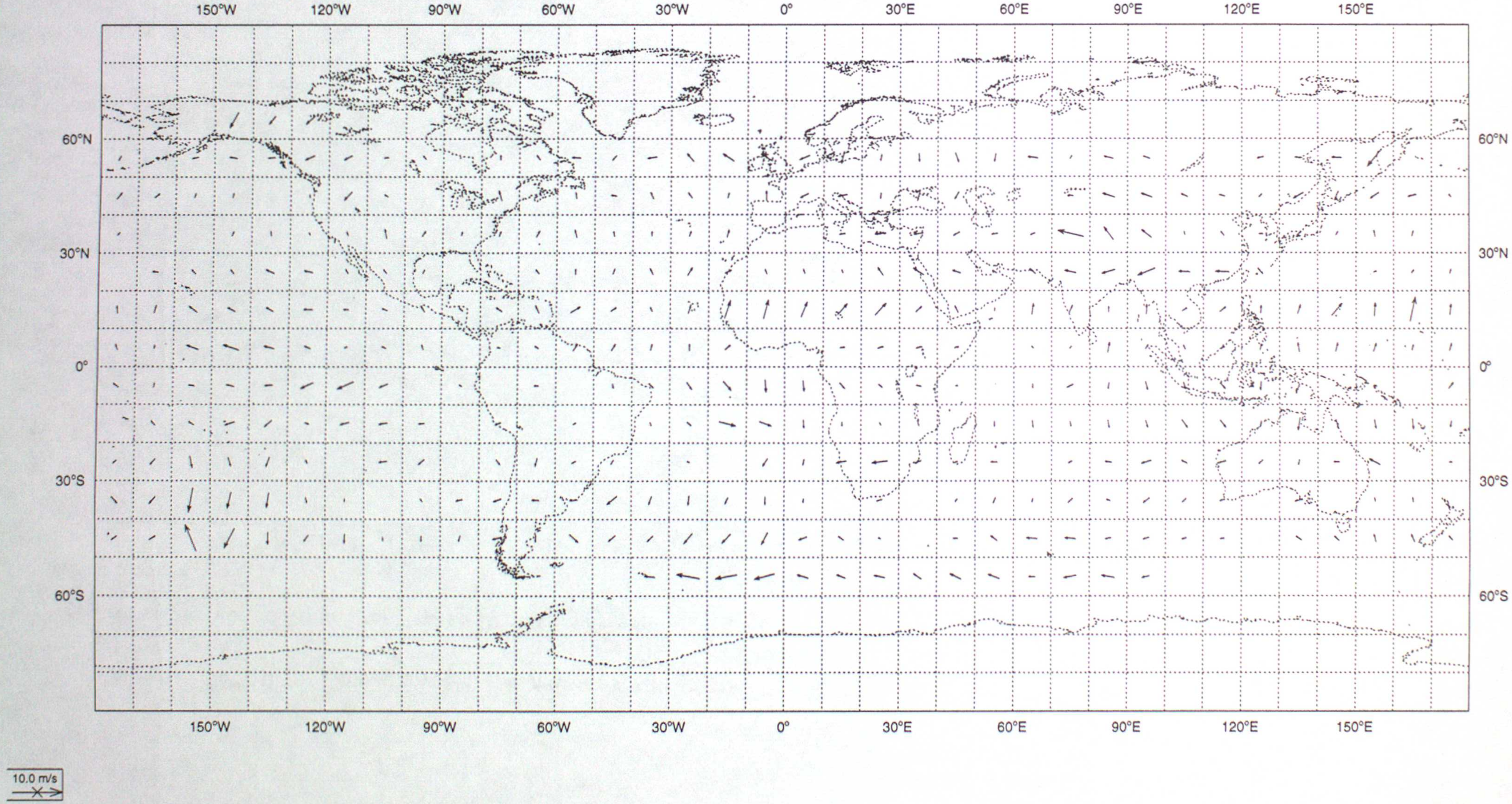

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). APRIL 2001

All observations

Values are plotted where greater than 10 obs are present

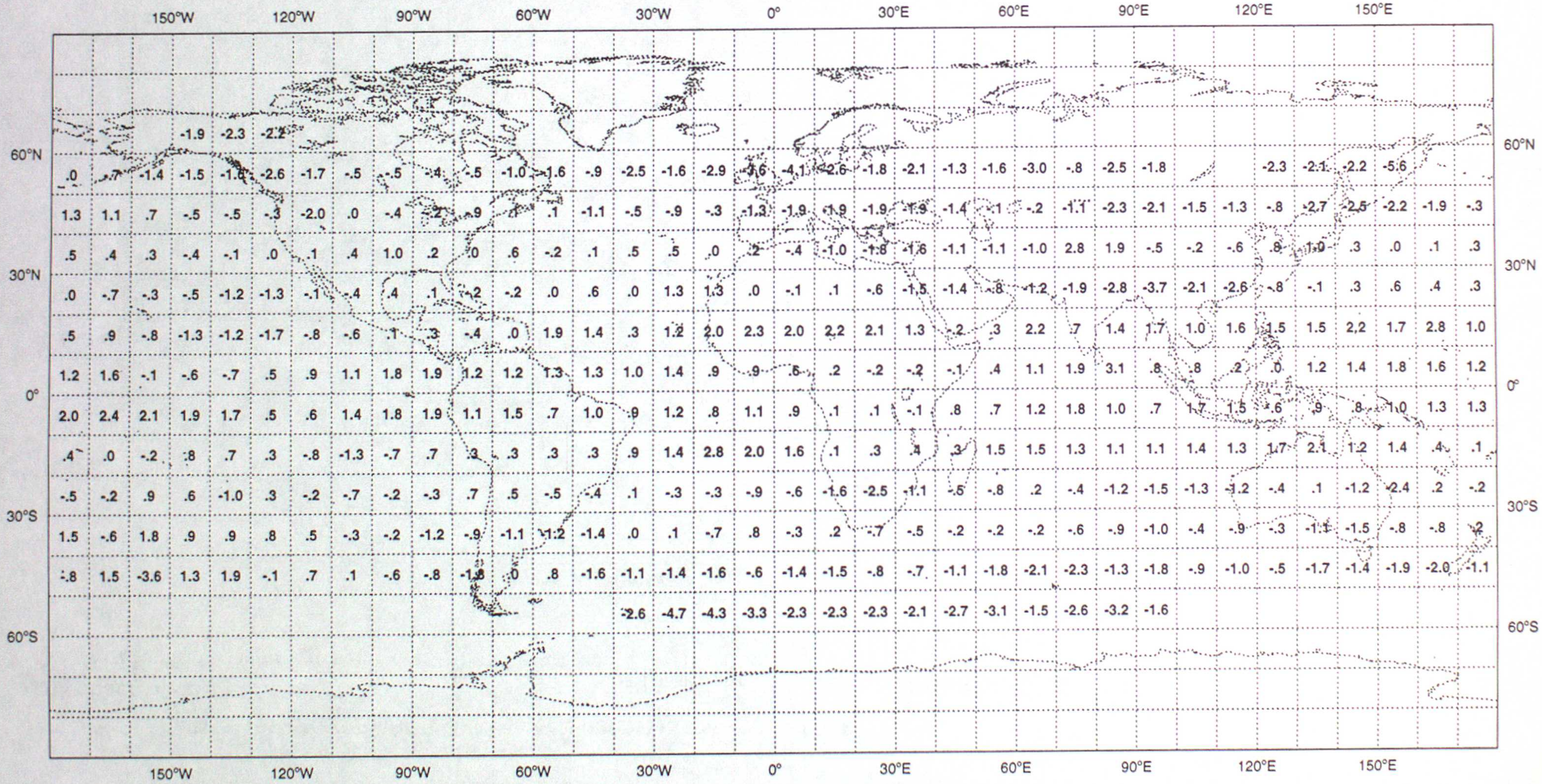
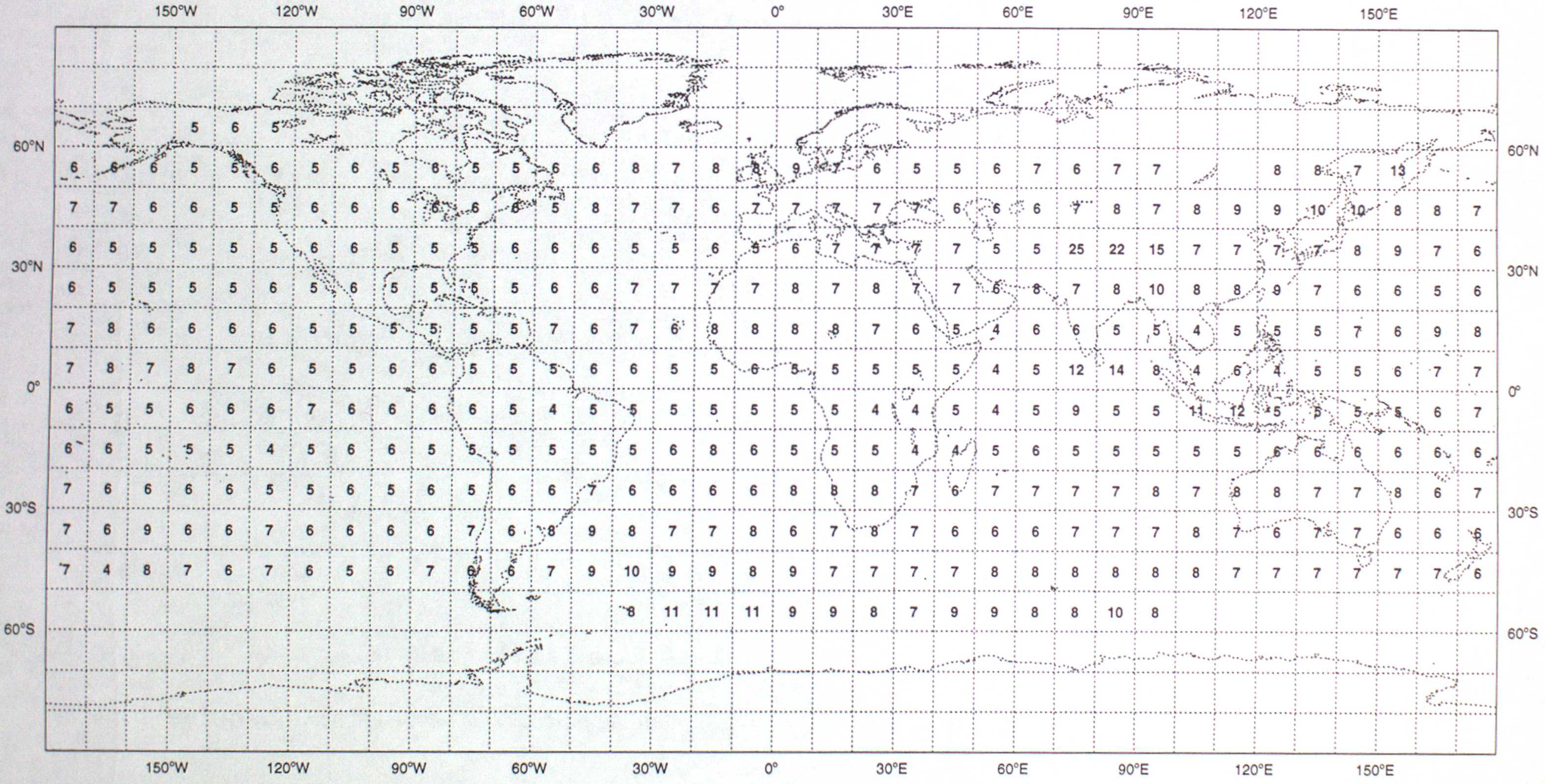

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-1.9 -2.3 -2.2
.0 -.7 -1.4 -1.5 -1.6 -2.6 -1.7 -.5 -.5 -.4 -.5 -1.0 -1.6 -.9 -2.5 -1.6 -2.9 -3.6 -4.1 -2.6 -1.8 -2.1 -1.3 -1.6 -3.0 -.8 -2.5 -1.8 -2.3 -2.1 -2.2 -5.6
1.3 1.1 .7 -.5 -.5 -.3 -2.0 .0 -.4 -.2 -.9 .1 .1 -1.1 -.5 -.9 -.3 -1.3 -1.9 -1.9 -1.9 -1.9 -1.4 -.1 -.2 -1.1 -2.3 -2.1 -1.5 -1.3 -.8 -2.7 -2.5 -2.2 -1.9 -.3
.5 .4 .3 -.4 -.1 .0 .1 .4 1.0 .2 .0 .6 -.2 .1 .5 .5 .0 .2 -.4 -1.0 -1.8 -1.6 -1.1 -1.1 -1.0 2.8 1.9 -.5 -.2 -.6 .8 1.0 .3 .0 .1 .3
.0 -.7 -.3 -.5 -1.2 -1.3 -.1 -.4 .4 .1 -.2 -.2 .0 .6 .0 1.3 1.3 .0 -.1 .1 -.6 -1.5 -1.4 -.8 -1.2 -1.9 -2.8 -3.7 -2.1 -2.6 -.8 -.1 .3 .6 .4 .3
.5 .9 -.8 -1.3 -1.2 -1.7 -.8 -.6 .1 .3 -.4 .0 1.9 1.4 .3 1.2 2.0 2.3 2.0 2.2 2.1 1.3 -.2 .3 2.2 .7 1.4 1.7 1.0 1.6 1.5 1.5 2.2 1.7 2.8 1.0
1.2 1.6 -.1 -.6 -.7 .5 .9 1.1 1.8 1.9 1.2 1.2 1.3 1.3 1.0 1.4 .9 .9 .6 .2 -.2 -.2 -.1 .4 1.1 1.9 3.1 .8 .8 .2 .0 1.2 1.4 1.8 1.6 1.2
2.0 2.4 2.1 1.9 1.7 .5 .6 1.4 1.8 1.9 1.1 1.5 .7 1.0 .9 1.2 .8 1.1 .9 .1 .1 -.1 .8 .7 1.2 1.8 1.0 .7 1.7 1.5 .6 .9 .8 1.0 1.3 1.3
.4 .0 -.2 .8 .7 .3 -.8 -1.3 -.7 .7 .3 .3 .3 .3 .9 1.4 2.8 2.0 1.6 .1 .3 .4 .3 1.5 1.5 1.3 1.1 1.1 1.4 1.3 1.7 2.1 1.2 1.4 .4 .1
-.5 -.2 .9 .6 -1.0 .3 -.2 -.7 -.2 -.3 .7 .5 -.5 -.4 .1 -.3 -.3 -.9 -.6 -1.6 -2.5 -1.1 -.5 -.8 .2 -.4 -1.2 -1.5 -1.3 -1.2 -.4 .1 -1.2 -2.4 .2 -.2
1.5 -.6 1.8 .9 .9 .8 .5 -.3 -.2 -1.2 -.9 -1.1 -1.2 -1.4 .0 .1 -.7 .8 -.3 .2 -.7 -.5 -.2 -.2 -.2 -.6 -.9 -1.0 -.4 -.9 -.3 -1.1 -1.5 -.8 -.8 .2
-.8 1.5 -3.6 1.3 1.9 -.1 .7 .1 -.6 -.8 -1.8 .0 .8 -1.6 -1.1 -1.4 -1.6 -.6 -1.4 -1.5 -.8 -.7 -1.1 -1.8 -2.1 -2.3 -1.3 -1.8 -.9 -1.0 -.5 -1.7 -1.4 -1.9 -2.0 -1.1
-2.6 -4.7 -4.3 -3.3 -2.3 -2.3 -2.3 -2.1 -2.7 -3.1 -1.5 -2.6 -3.2 -1.6

Figure 24. SATOB 101 - 400 hPa RMS O-B vector differences (ms-1). APRIL 2001

All observations

Values are plotted where greater than 10 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
5 6 5
6 6 6 5 5 6 5 6 5 6 5 5 6 6 8 7 8 8 9 7 6 5 5 6 7 6 7 7 8 8 7 13
7 7 6 6 5 5 6 6 6 6 6 6 5 8 7 7 6 7 7 7 7 7 6 6 6 7 8 7 8 9 9 10 10 8 8 7
6 5 5 5 5 5 6 6 5 5 5 6 6 6 5 5 6 5 6 7 7 7 7 5 5 25 22 15 7 7 7 7 8 9 7 6
6 5 5 5 5 6 5 6 5 5 6 5 6 6 7 7 7 7 8 7 8 7 7 6 8 7 8 10 8 8 9 7 6 6 5 6
7 8 6 6 6 6 5 5 5 5 5 5 7 6 7 6 8 8 8 8 7 6 5 4 6 6 5 5 4 5 5 5 7 6 9 8
7 8 7 8 7 6 5 5 6 6 5 5 5 6 6 5 5 6 5 5 5 5 5 4 5 12 14 8 4 6 4 5 5 6 7 7
6 5 5 6 6 6 7 6 6 6 6 5 4 5 5 5 5 5 5 5 4 4 5 4 5 9 5 5 11 12 5 5 5 5 6 7
6 6 5 5 5 4 5 6 6 5 5 5 5 5 5 6 8 6 5 5 5 4 4 5 6 5 5 5 5 5 6 6 6 6 6 6
7 6 6 6 6 5 5 6 5 6 5 6 6 7 6 6 6 6 8 8 8 7 6 7 7 7 7 8 7 8 8 7 7 8 6 7
7 6 9 6 6 7 6 6 6 6 7 6 8 9 8 7 7 8 6 7 8 7 6 6 6 7 7 7 8 7 6 7 7 6 6 6
7 4 8 7 6 7 6 5 6 7 6 6 7 9 10 9 9 8 9 7 7 7 7 8 8 8 8 8 8 7 7 7 7 7 7 6
8 11 11 11 9 9 8 7 9 9 8 8 10 8

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: April 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15 and NOAA-16.

Standard of comparison :Background field from UKMO global model.

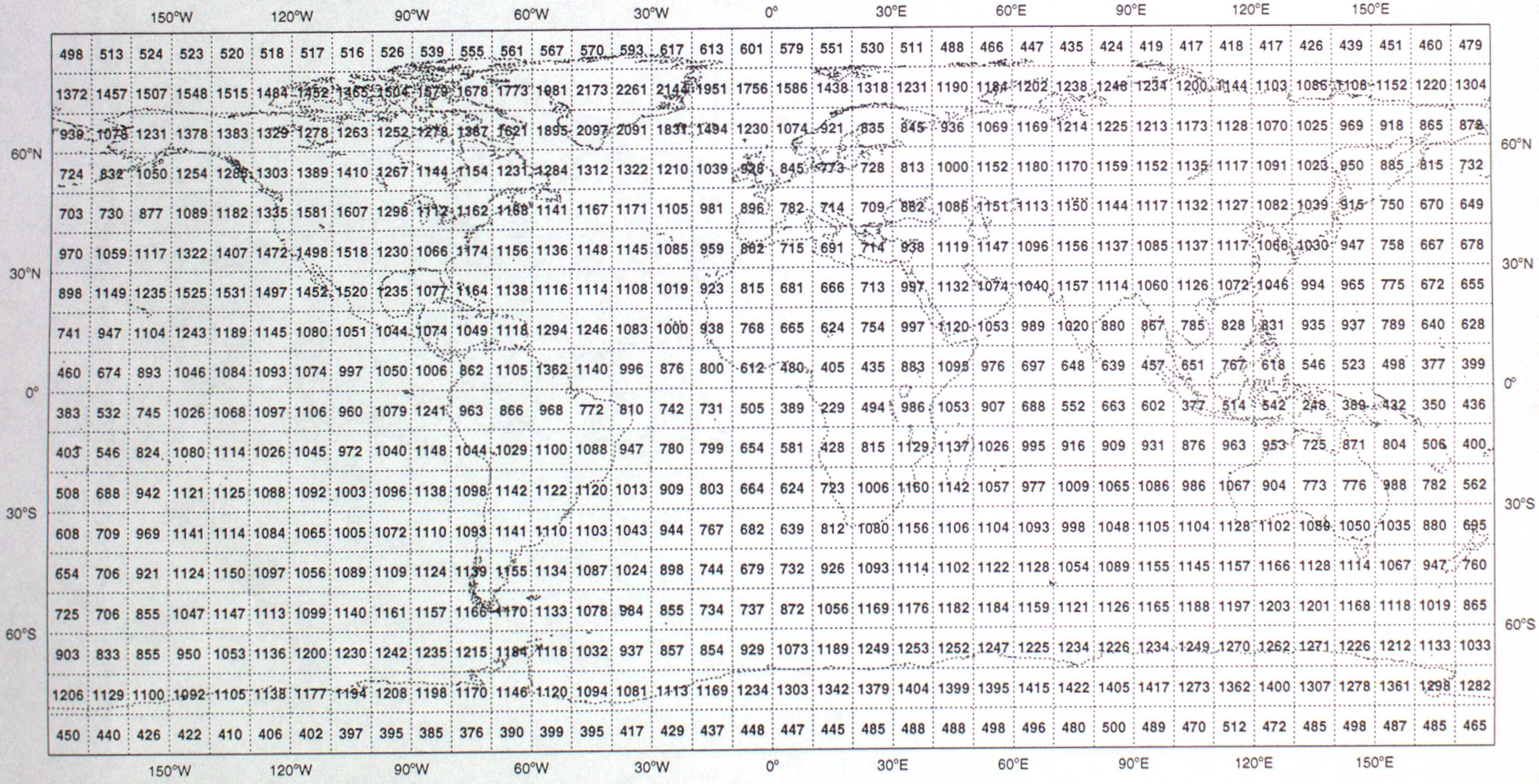
Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

- HIRS8 (Surface)
- HIRS15 (700)
- HIRS11 (500-700)
- HIRS4 (400)
- AMSUA5 (700)
- AMSUA7 (300)
- AMSUA9 (100)

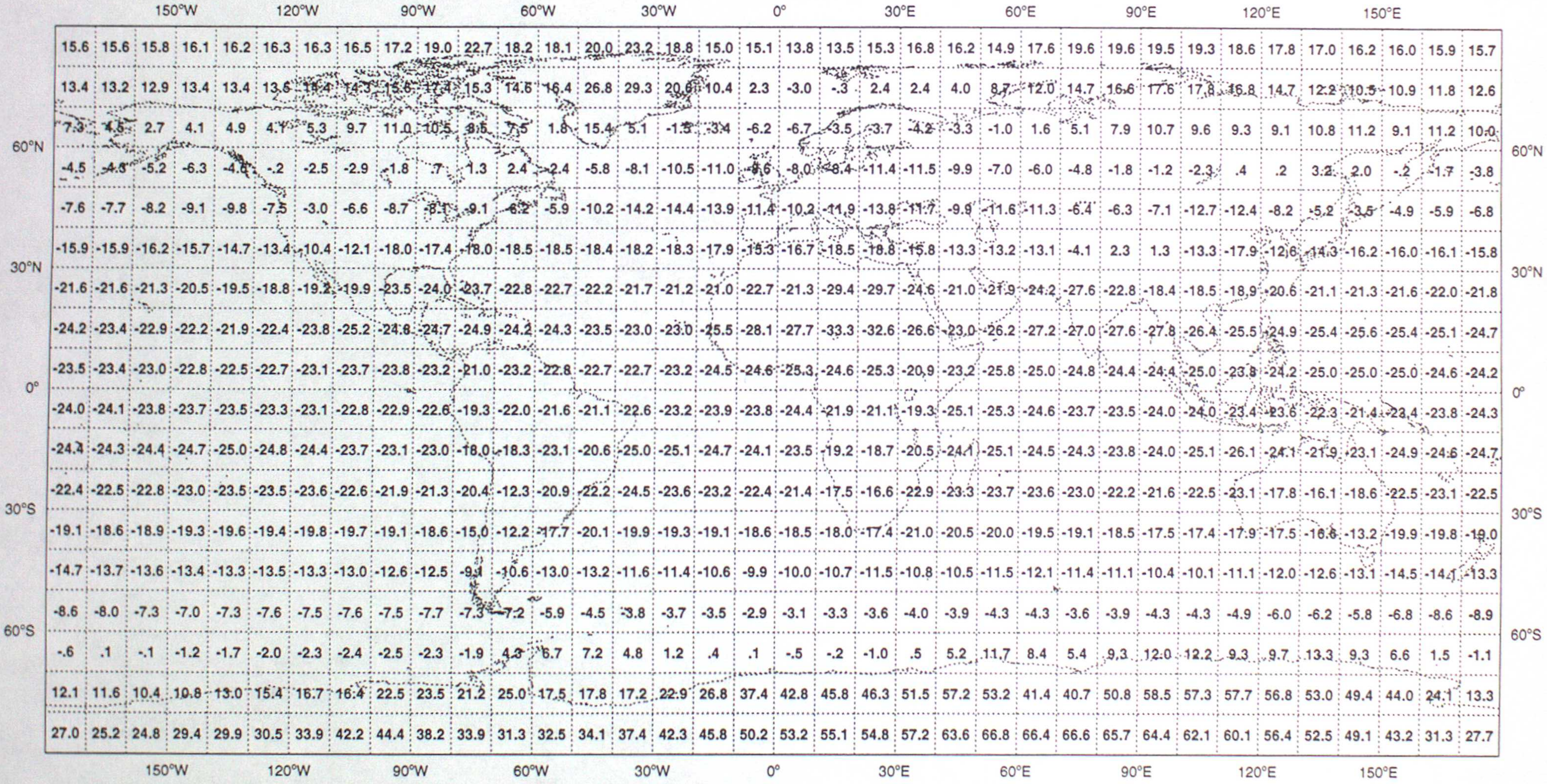
:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. APRIL 2001
NOAA15, using all observations
Global average number of observations in 24 hours = 635891



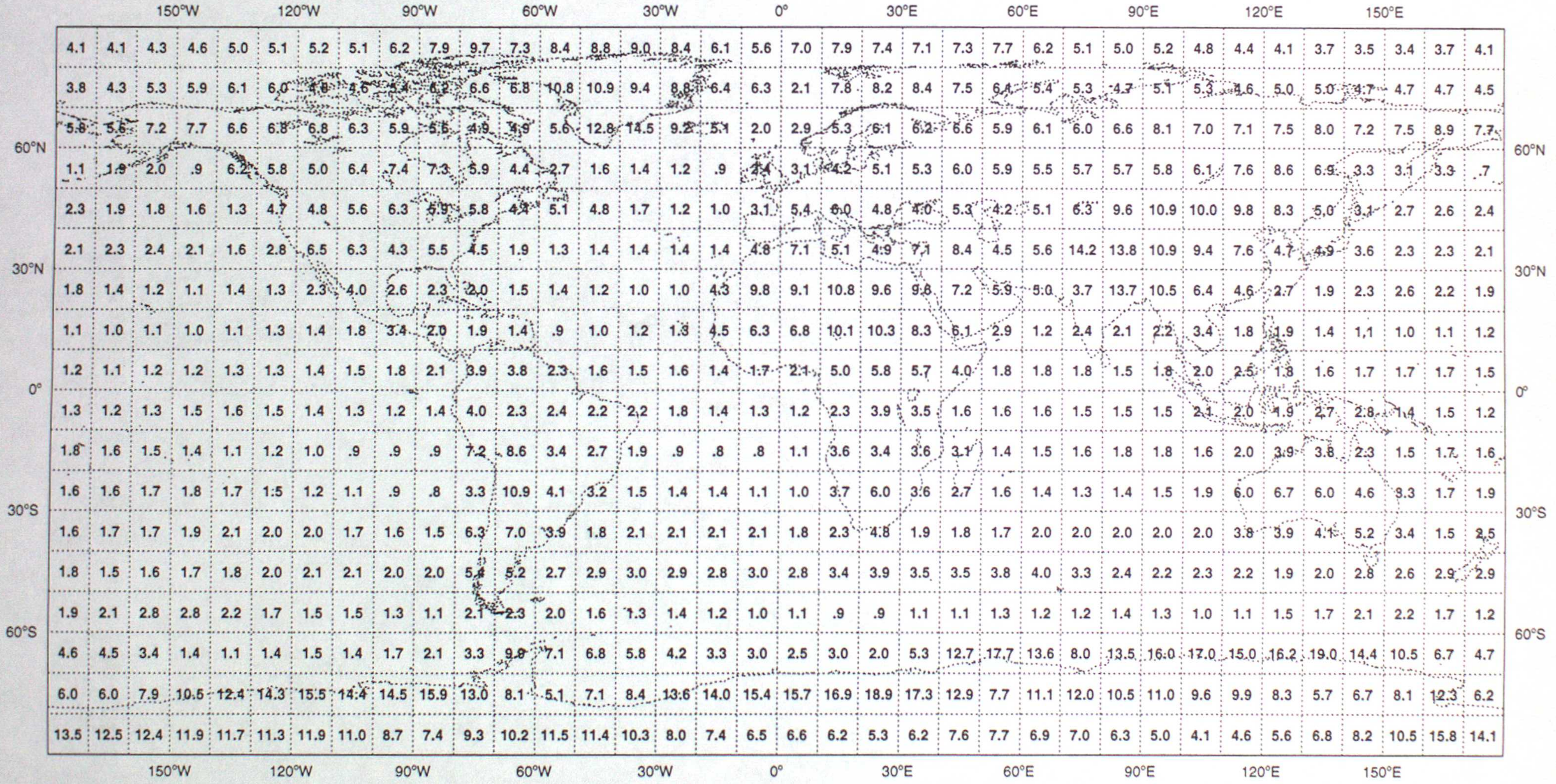
498	513	524	523	520	518	517	516	526	539	555	561	567	570	593	617	613	601	579	551	530	511	488	466	447	435	424	419	417	418	417	426	439	451	460	479
1372	1457	1507	1548	1515	1484	1452	1465	1504	1579	1678	1773	1981	2173	2261	2144	1951	1756	1586	1438	1318	1231	1190	1184	1202	1238	1246	1234	1200	1144	1103	1086	1108	1152	1220	1304
939	1078	1231	1378	1383	1329	1278	1263	1252	1278	1367	1621	1895	2097	2091	1831	1494	1230	1074	921	835	845	936	1069	1169	1214	1225	1213	1173	1128	1070	1025	969	918	865	878
724	832	1050	1254	1288	1303	1389	1410	1267	1144	1154	1231	1284	1312	1322	1210	1039	928	845	773	728	813	1000	1152	1180	1170	1159	1152	1135	1117	1091	1023	950	885	815	732
703	730	877	1089	1182	1335	1581	1607	1298	1112	1162	1168	1141	1167	1171	1105	981	896	782	714	709	882	1086	1151	1113	1150	1144	1117	1132	1127	1082	1039	915	750	670	649
970	1059	1117	1322	1407	1472	1498	1518	1230	1066	1174	1156	1136	1148	1145	1085	959	862	715	691	714	938	1119	1147	1096	1156	1137	1085	1137	1117	1066	1030	947	758	667	678
898	1149	1235	1525	1531	1497	1452	1520	1235	1077	1164	1138	1116	1114	1108	1019	923	815	681	666	713	997	1132	1074	1040	1157	1114	1060	1126	1072	1046	994	965	775	672	655
741	947	1104	1243	1189	1145	1080	1051	1044	1074	1049	1118	1294	1246	1083	1000	938	768	665	624	754	997	1120	1053	989	1020	880	857	785	828	831	935	937	789	640	628
460	674	893	1046	1084	1093	1074	997	1050	1006	862	1105	1362	1140	996	876	800	612	480	405	435	883	1095	976	697	648	639	457	651	767	618	546	523	498	377	399
383	532	745	1026	1068	1097	1106	960	1079	1241	963	866	968	772	810	742	731	505	389	229	494	986	1053	907	688	552	663	602	377	514	542	248	389	432	350	436
403	546	824	1080	1114	1026	1045	972	1040	1148	1044	1029	1100	1088	947	780	799	654	581	428	815	1129	1137	1026	995	916	909	931	876	963	953	725	871	804	506	400
508	688	942	1121	1125	1088	1092	1003	1096	1138	1098	1142	1122	1120	1013	909	803	664	624	723	1006	1160	1142	1057	977	1009	1065	1086	986	1067	904	773	776	988	782	562
608	709	969	1141	1114	1084	1065	1005	1072	1110	1093	1141	1110	1103	1043	944	767	682	639	812	1080	1156	1106	1104	1093	998	1048	1105	1104	1128	1102	1089	1050	1035	880	695
654	706	921	1124	1150	1097	1056	1089	1109	1124	1139	1155	1134	1087	1024	898	744	679	732	926	1093	1114	1102	1122	1128	1054	1089	1155	1145	1157	1166	1128	1114	1067	947	760
725	706	855	1047	1147	1113	1099	1140	1161	1157	1166	1170	1133	1078	984	855	734	737	872	1056	1169	1176	1182	1184	1159	1121	1126	1165	1188	1197	1203	1201	1168	1118	1019	865
903	833	855	950	1053	1136	1200	1230	1242	1235	1215	1184	1118	1032	937	857	854	929	1073	1189	1249	1253	1252	1247	1225	1234	1226	1234	1249	1270	1262	1271	1226	1212	1133	1033
1206	1129	1100	1092	1105	1138	1177	1194	1208	1198	1170	1146	1120	1094	1081	1113	1169	1234	1303	1342	1379	1404	1399	1395	1415	1422	1405	1417	1273	1362	1400	1307	1278	1361	1298	1282
450	440	426	422	410	406	402	397	395	385	376	390	399	395	417	429	437	448	447	445	485	488	488	498	496	480	500	489	470	512	472	485	498	487	485	465

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001
Channel: HIRS8 (Surface)
NOAA15, using all observations



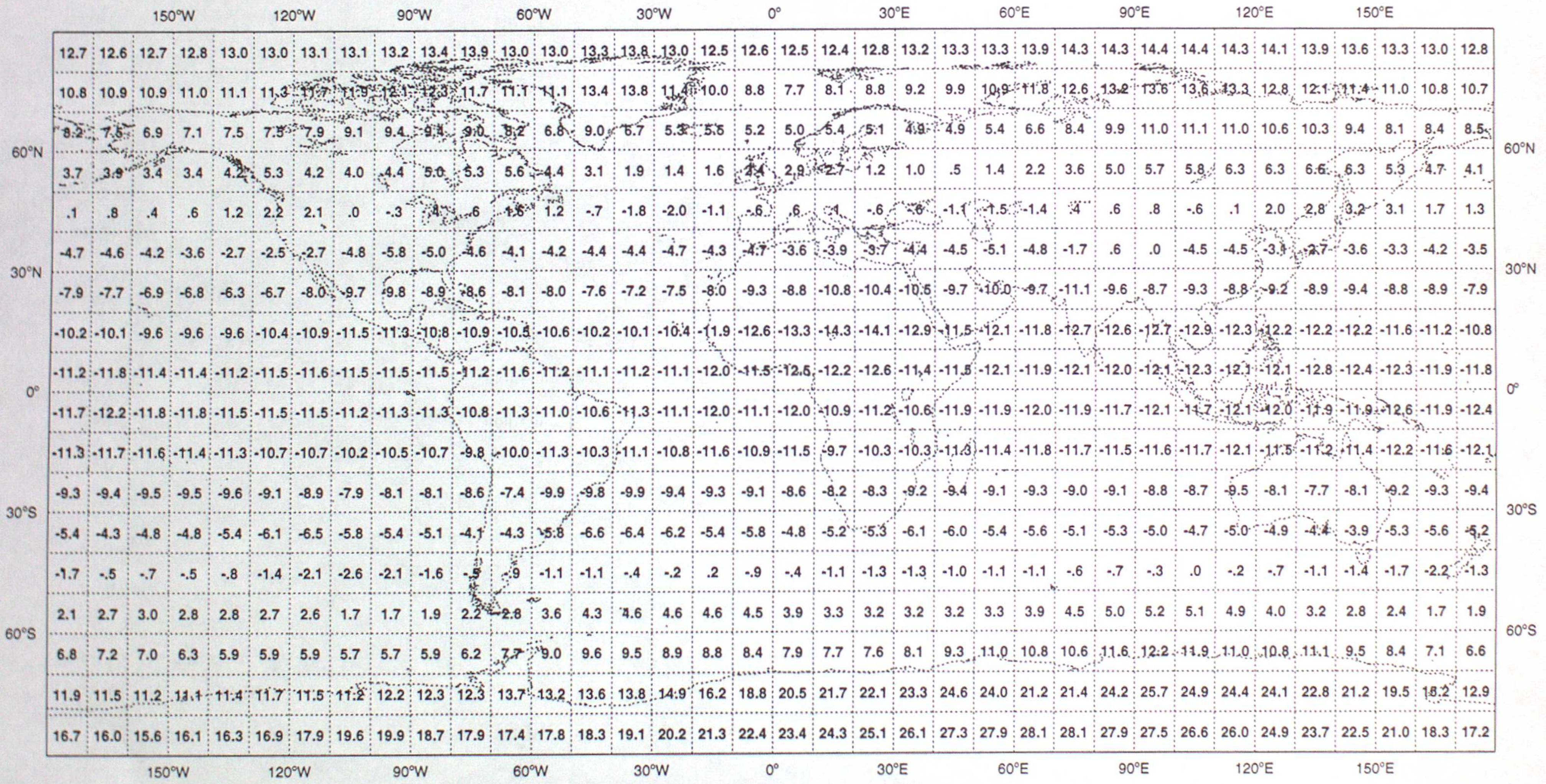
15.6	15.6	15.8	16.1	16.2	16.3	16.3	16.5	17.2	19.0	22.7	18.2	18.1	20.0	23.2	18.8	15.0	15.1	13.8	13.5	15.3	16.8	16.2	14.9	17.6	19.6	19.6	19.5	19.3	18.6	17.8	17.0	16.2	16.0	15.9	15.7
13.4	13.2	12.9	13.4	13.4	13.6	14.4	14.3	15.6	17.4	15.3	14.6	16.4	26.8	29.3	20.6	10.4	2.3	-3.0	-.3	2.4	2.4	4.0	8.7	12.0	14.7	16.6	17.6	17.8	16.8	14.7	12.2	10.5	10.9	11.8	12.6
7.3	4.5	2.7	4.1	4.9	4.1	5.3	9.7	11.0	10.5	8.5	7.5	1.8	15.4	5.1	-1.5	-3.4	-6.2	-6.7	-3.5	-3.7	-4.2	-3.3	-1.0	1.6	5.1	7.9	10.7	9.6	9.3	9.1	10.8	11.2	9.1	11.2	10.0
-4.5	-4.8	-5.2	-6.3	-4.6	-.2	-2.5	-2.9	-1.8	.7	1.3	2.4	-2.4	-5.8	-8.1	-10.5	-11.0	-8.6	-8.0	-8.4	-11.4	-11.5	-9.9	-7.0	-6.0	-4.8	-1.8	-1.2	-2.3	.4	.2	3.2	2.0	-.2	-1.7	-3.8
-7.6	-7.7	-8.2	-9.1	-9.8	-7.5	-3.0	-6.6	-8.7	-8.1	-9.1	-6.2	-5.9	-10.2	-14.2	-14.4	-13.9	-11.4	-10.2	-11.9	-13.8	-11.7	-9.9	-11.6	-11.3	-6.4	-6.3	-7.1	-12.7	-12.4	-8.2	-5.2	-3.5	-4.9	-5.9	-6.8
-15.9	-15.9	-16.2	-15.7	-14.7	-13.4	-10.4	-12.1	-18.0	-17.4	-18.0	-18.5	-18.5	-18.4	-18.2	-18.3	-17.9	-15.3	-16.7	-18.5	-18.8	-15.8	-13.3	-13.2	-13.1	-4.1	2.3	1.3	-13.3	-17.9	-12.6	-14.3	-16.2	-16.0	-16.1	-15.8
-21.6	-21.6	-21.3	-20.5	-19.5	-18.8	-19.2	-19.9	-23.5	-24.0	-23.7	-22.8	-22.7	-22.2	-21.7	-21.2	-21.0	-22.7	-21.3	-29.4	-29.7	-24.6	-21.0	-21.9	-24.2	-27.6	-22.8	-18.4	-18.5	-18.9	-20.6	-21.1	-21.3	-21.6	-22.0	-21.8
-24.2	-23.4	-22.9	-22.2	-21.9	-22.4	-23.8	-25.2	-24.8	-24.7	-24.9	-24.2	-24.3	-23.5	-23.0	-23.0	-25.5	-28.1	-27.7	-33.3	-32.6	-26.6	-23.0	-26.2	-27.2	-27.0	-27.6	-27.8	-26.4	-25.5	-24.9	-25.4	-25.6	-25.4	-25.1	-24.7
-23.5	-23.4	-23.0	-22.8	-22.5	-22.7	-23.1	-23.7	-23.8	-23.2	-21.0	-23.2	-22.8	-22.7	-22.7	-23.2	-24.5	-24.6	-25.3	-24.6	-25.3	-20.9	-23.2	-25.8	-25.0	-24.8	-24.4	-24.4	-25.0	-23.8	-24.2	-25.0	-25.0	-25.0	-24.6	-24.2
-24.0	-24.1	-23.8	-23.7	-23.5	-23.3	-23.1	-22.8	-22.9	-22.6	-19.3	-22.0	-21.6	-21.1	-22.6	-23.2	-23.9	-23.8	-24.4	-21.9	-21.1	-19.3	-25.1	-25.3	-24.6	-23.7	-23.5	-24.0	-24.0	-23.4	-23.6	-22.3	-21.4	-23.4	-23.8	-24.3
-24.4	-24.3	-24.4	-24.7	-25.0	-24.8	-24.4	-23.7	-23.1	-23.0	-18.0	-18.3	-23.1	-20.6	-25.0	-25.1	-24.7	-24.1	-23.5	-19.2	-18.7	-20.5	-24.1	-25.1	-24.5	-24.3	-23.8	-24.0	-25.1	-26.1	-24.1	-21.9	-23.1	-24.9	-24.6	-24.7
-22.4	-22.5	-22.8	-23.0	-23.5	-23.5	-23.6	-22.6	-21.9	-21.3	-20.4	-12.3	-20.9	-22.2	-24.5	-23.6	-23.2	-22.4	-21.4	-17.5	-16.6	-22.9	-23.3	-23.7	-23.6	-23.0	-22.2	-21.6	-22.5	-23.1	-17.8	-16.1	-18.6	-22.5	-23.1	-22.5
-19.1	-18.6	-18.9	-19.3	-19.6	-19.4	-19.8	-19.7	-19.1	-18.6	-15.0	-12.2	-17.7	-20.1	-19.9	-19.3	-19.1	-18.6	-18.5	-18.0	-17.4	-21.0	-20.5	-20.0	-19.5	-19.1	-18.5	-17.5	-17.4	-17.9	-17.5	-16.6	-13.2	-19.9	-19.8	-19.0
-14.7	-13.7	-13.6	-13.4	-13.3	-13.5	-13.3	-13.0	-12.6	-12.5	-9.1	-10.6	-13.0	-13.2	-11.6	-11.4	-10.6	-9.9	-10.0	-10.7	-11.5	-10.8	-10.5	-11.5	-12.1	-11.4	-11.1	-10.4	-10.1	-11.1	-12.0	-12.6	-13.1	-14.5	-14.1	-13.3
-8.6	-8.0	-7.3	-7.0	-7.3	-7.6	-7.5	-7.6	-7.5	-7.7	-7.3	-7.2	-5.9	-4.5	-3.8	-3.7	-3.5	-2.9	-3.1	-3.3	-3.6	-4.0	-3.9	-4.3	-4.3	-3.6	-3.9	-4.3	-4.3	-4.9	-6.0	-6.2	-5.8	-6.8	-8.6	-8.9
-.6	.1	-.1	-1.2	-1.7	-2.0	-2.3	-2.4	-2.5	-2.3	-1.9	4.3	6.7	7.2	4.8	1.2	.4	.1	-.5	-.2	-1.0	.5	5.2	11.7	8.4	5.4	9.3	12.0	12.2	9.3	9.7	13.3	9.3	6.6	1.5	-1.1
12.1	11.6	10.4	10.8	13.0	15.4	16.7	16.4	22.5	23.5	21.2	25.0	17.5	17.8	17.2	22.9	26.8	37.4	42.8	45.8	46.3	51.5	57.2	53.2	41.4	40.7	50.8	58.5	57.3	57.7	56.8	53.0	49.4	44.0	24.1	13.3
27.0	25.2	24.8	29.4	29.9	30.5	33.9	42.2	44.4	38.2	33.9	31.3	32.5	34.1	37.4	42.3	45.8	50.2	53.2	55.1	54.8	57.2	63.6	66.8	66.4	66.6	65.7	64.4	62.1	60.1	56.4	52.5	49.1	43.2	31.3	27.7

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001
Channel: HIRS8 (Surface)
NOAA15, using all observations



4.1	4.1	4.3	4.6	5.0	5.1	5.2	5.1	6.2	7.9	9.7	7.3	8.4	8.8	9.0	8.4	6.1	5.6	7.0	7.9	7.4	7.1	7.3	7.7	6.2	5.1	5.0	5.2	4.8	4.4	4.1	3.7	3.5	3.4	3.7	4.1
3.8	4.3	5.3	5.9	6.1	6.0	4.8	4.6	5.4	6.2	6.6	6.8	10.8	10.9	9.4	8.8	6.4	6.3	2.1	7.8	8.2	8.4	7.5	6.4	5.4	5.3	4.7	5.1	5.3	4.6	5.0	5.0	4.7	4.7	4.7	4.5
5.8	5.6	7.2	7.7	6.6	6.8	6.8	6.3	5.9	5.5	4.9	4.9	5.6	12.8	14.5	9.2	5.1	2.0	2.9	5.3	6.1	6.2	6.6	5.9	6.1	6.0	6.6	8.1	7.0	7.1	7.5	8.0	7.2	7.5	8.9	7.7
1.1	1.9	2.0	.9	6.2	5.8	5.0	6.4	7.4	7.3	5.9	4.4	2.7	1.6	1.4	1.2	.9	2.4	3.1	4.2	5.1	5.3	6.0	5.9	5.5	5.7	5.7	5.8	6.1	7.6	8.6	6.9	3.3	3.1	3.3	.7
2.3	1.9	1.8	1.6	1.3	4.7	4.8	5.6	6.3	5.9	5.8	4.4	5.1	4.8	1.7	1.2	1.0	3.1	5.4	6.0	4.8	4.0	5.3	4.2	5.1	6.3	9.6	10.9	10.0	9.8	8.3	5.0	3.1	2.7	2.6	2.4
2.1	2.3	2.4	2.1	1.6	2.8	6.5	6.3	4.3	5.5	4.5	1.9	1.3	1.4	1.4	1.4	1.4	4.8	7.1	5.1	4.9	7.1	8.4	4.5	5.6	14.2	13.8	10.9	9.4	7.6	4.7	4.9	3.6	2.3	2.3	2.1
1.8	1.4	1.2	1.1	1.4	1.3	2.3	4.0	2.6	2.3	2.0	1.5	1.4	1.2	1.0	1.0	4.3	9.8	9.1	10.8	9.6	9.8	7.2	5.9	5.0	3.7	13.7	10.5	6.4	4.6	2.7	1.9	2.3	2.6	2.2	1.9
1.1	1.0	1.1	1.0	1.1	1.3	1.4	1.8	3.4	2.0	1.9	1.4	.9	1.0	1.2	1.3	4.5	6.3	6.8	10.1	10.3	8.3	6.1	2.9	1.2	2.4	2.1	2.2	3.4	1.8	1.9	1.4	1.1	1.0	1.1	1.2
1.2	1.1	1.2	1.2	1.3	1.3	1.4	1.5	1.8	2.1	3.9	3.8	2.3	1.6	1.5	1.6	1.4	1.7	2.1	5.0	5.8	5.7	4.0	1.8	1.8	1.8	1.5	1.8	2.0	2.5	1.8	1.6	1.7	1.7	1.7	1.5
1.3	1.2	1.3	1.5	1.6	1.5	1.4	1.3	1.2	1.4	4.0	2.3	2.4	2.2	2.2	1.8	1.4	1.3	1.2	2.3	3.9	3.5	1.6	1.6	1.6	1.5	1.5	1.5	2.1	2.0	1.9	2.7	2.8	1.4	1.5	1.2
1.8	1.6	1.5	1.4	1.1	1.2	1.0	.9	.9	.9	7.2	8.6	3.4	2.7	1.9	.9	.8	.8	1.1	3.6	3.4	3.6	3.1	1.4	1.5	1.6	1.8	1.8	1.6	2.0	3.9	3.8	2.3	1.5	1.7	1.6
1.6	1.6	1.7	1.8	1.7	1.5	1.2	1.1	.9	.8	3.3	10.9	4.1	3.2	1.5	1.4	1.4	1.1	1.0	3.7	6.0	3.6	2.7	1.6	1.4	1.3	1.4	1.5	1.9	6.0	6.7	6.0	4.6	3.3	1.7	1.9
1.6	1.7	1.7	1.9	2.1	2.0	2.0	1.7	1.6	1.5	6.3	7.0	3.9	1.8	2.1	2.1	2.1	2.1	1.8	2.3	4.8	1.9	1.8	1.7	2.0	2.0	2.0	2.0	2.0	3.8	3.9	4.1	5.2	3.4	1.5	2.5
1.8	1.5	1.6	1.7	1.8	2.0	2.1	2.1	2.0	2.0	5.4	5.2	2.7	2.9	3.0	2.9	2.8	3.0	2.8	3.4	3.9	3.5	3.5	3.8	4.0	3.3	2.4	2.2	2.3	2.2	1.9	2.0	2.8	2.6	2.9	2.9
1.9	2.1	2.8	2.8	2.2	1.7	1.5	1.5	1.3	1.1	2.1	2.3	2.0	1.6	1.3	1.4	1.2	1.0	1.1	.9	.9	1.1	1.1	1.3	1.2	1.2	1.4	1.3	1.0	1.1	1.5	1.7	2.1	2.2	1.7	1.2
4.6	4.5	3.4	1.4	1.1	1.4	1.5	1.4	1.7	2.1	3.3	9.8	7.1	6.8	5.8	4.2	3.3	3.0	2.5	3.0	2.0	5.3	12.7	17.7	13.6	8.0	13.5	16.0	17.0	15.0	16.2	19.0	14.4	10.5	6.7	4.7
6.0	6.0	7.9	10.5	12.4	14.3	15.5	14.4	14.5	15.9	13.0	8.1	5.1	7.1	8.4	13.6	14.0	15.4	15.7	16.9	18.9	17.3	12.9	7.7	11.1	12.0	10.5	11.0	9.6	9.9	8.3	5.7	6.7	8.1	12.3	6.2
13.5	12.5	12.4	11.9	11.7	11.3	11.9	11.0	8.7	7.4	9.3	10.2	11.5	11.4	10.3	8.0	7.4	6.5	6.6	6.2	5.3	6.2	7.6	7.7	6.9	7.0	6.3	5.0	4.1	4.6	5.6	6.8	8.2	10.5	15.8	14.1

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001
Channel: HIRS15 (700 hPa)
NOAA15, using all observations

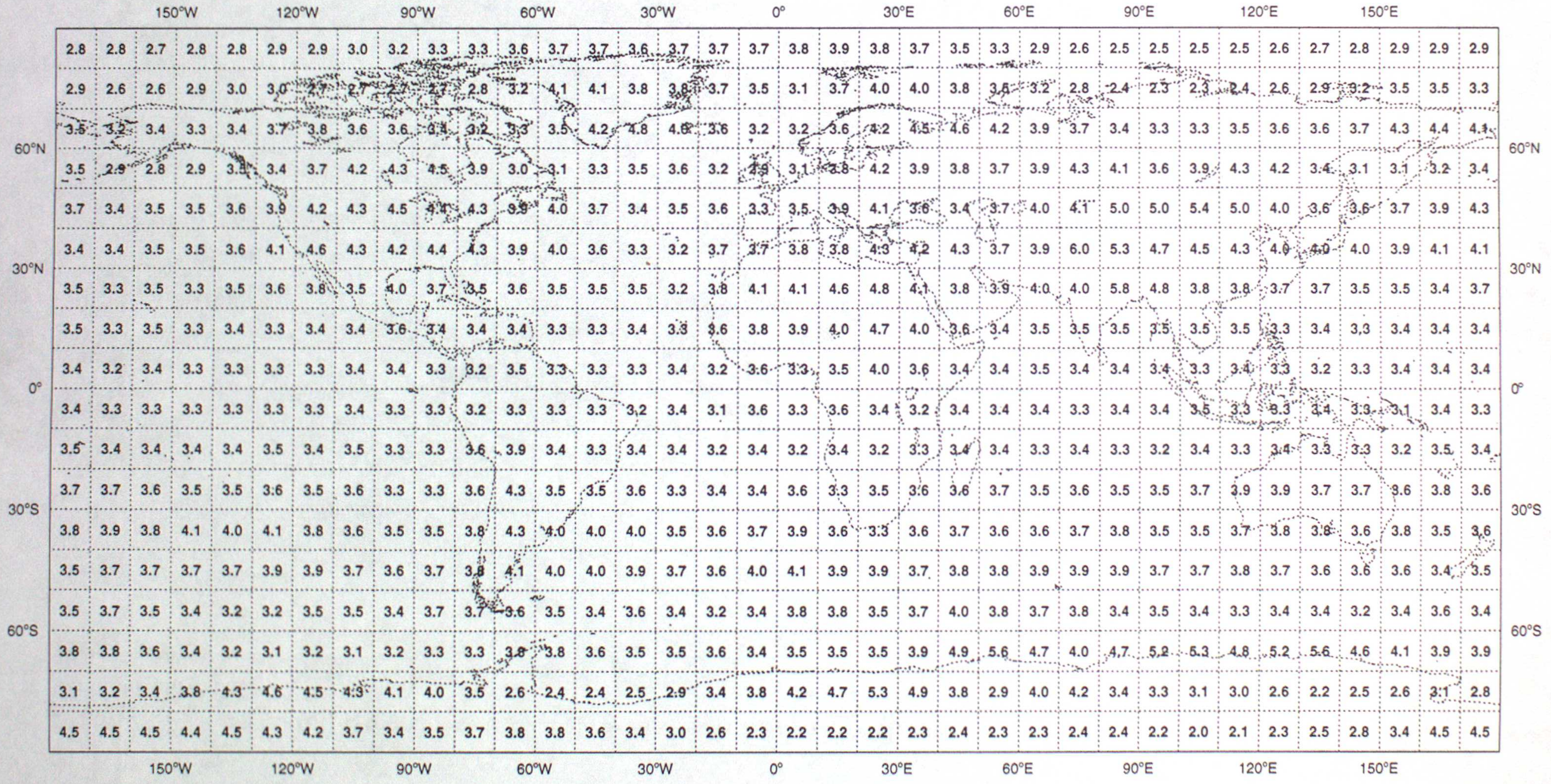


12.7	12.6	12.7	12.8	13.0	13.0	13.1	13.1	13.2	13.4	13.9	13.0	13.0	13.3	13.8	13.0	12.5	12.6	12.5	12.4	12.8	13.2	13.3	13.3	13.9	14.3	14.3	14.4	14.4	14.3	14.1	13.9	13.6	13.3	13.0	12.8
10.8	10.9	10.9	11.0	11.1	11.3	11.7	11.9	12.1	12.3	11.7	11.1	11.1	13.4	13.8	11.4	10.0	8.8	7.7	8.1	8.8	9.2	9.9	10.9	11.8	12.6	13.2	13.6	13.6	13.3	12.8	12.1	11.4	11.0	10.8	10.7
8.2	7.5	6.9	7.1	7.5	7.5	7.9	9.1	9.4	9.4	9.0	8.2	6.8	9.0	6.7	5.3	5.5	5.2	5.0	5.4	5.1	4.9	4.9	5.4	6.6	8.4	9.9	11.0	11.1	11.0	10.6	10.3	9.4	8.1	8.4	8.5
3.7	3.9	3.4	3.4	4.2	5.3	4.2	4.0	4.4	5.0	5.3	5.6	4.4	3.1	1.9	1.4	1.6	2.4	2.9	2.7	1.2	1.0	.5	1.4	2.2	3.6	5.0	5.7	5.8	6.3	6.3	6.6	6.3	5.3	4.7	4.1
.1	.8	.4	.6	1.2	2.2	2.1	.0	-.3	.4	.6	1.6	1.2	-.7	-1.8	-2.0	-1.1	-.6	.6	.1	-.6	-.6	-1.1	-1.5	-1.4	.4	.6	.8	-.6	.1	2.0	2.8	3.2	3.1	1.7	1.3
-4.7	-4.6	-4.2	-3.6	-2.7	-2.5	-2.7	-4.8	-5.8	-5.0	-4.6	-4.1	-4.2	-4.4	-4.4	-4.7	-4.3	-4.7	-3.6	-3.9	-3.7	-4.4	-4.5	-5.1	-4.8	-1.7	.6	.0	-4.5	-4.5	-3.1	-2.7	-3.6	-3.3	-4.2	-3.5
-7.9	-7.7	-6.9	-6.8	-6.3	-6.7	-8.0	-9.7	-9.8	-8.9	-8.6	-8.1	-8.0	-7.6	-7.2	-7.5	-8.0	-9.3	-8.8	-10.8	-10.4	-10.5	-9.7	-10.0	-9.7	-11.1	-9.6	-8.7	-9.3	-8.8	-9.2	-8.9	-9.4	-8.8	-8.9	-7.9
-10.2	-10.1	-9.6	-9.6	-9.6	-10.4	-10.9	-11.5	-11.3	-10.8	-10.9	-10.5	-10.6	-10.2	-10.1	-10.4	-11.9	-12.6	-13.3	-14.3	-14.1	-12.9	-11.5	-12.1	-11.8	-12.7	-12.6	-12.7	-12.9	-12.3	-12.2	-12.2	-12.2	-11.6	-11.2	-10.8
-11.2	-11.8	-11.4	-11.4	-11.2	-11.5	-11.6	-11.5	-11.5	-11.5	-11.2	-11.6	-11.2	-11.1	-11.2	-11.1	-12.0	-11.5	-12.5	-12.2	-12.6	-11.4	-11.5	-12.1	-11.9	-12.1	-12.0	-12.1	-12.3	-12.1	-12.1	-12.8	-12.4	-12.3	-11.9	-11.8
-11.7	-12.2	-11.8	-11.8	-11.5	-11.5	-11.5	-11.2	-11.3	-11.3	-10.8	-11.3	-11.0	-10.6	-11.3	-11.1	-12.0	-11.1	-12.0	-10.9	-11.2	-10.6	-11.9	-11.9	-12.0	-11.9	-11.7	-12.1	-11.7	-12.1	-12.0	-11.9	-11.9	-12.6	-11.9	-12.4
-11.3	-11.7	-11.6	-11.4	-11.3	-10.7	-10.7	-10.2	-10.5	-10.7	-9.8	-10.0	-11.3	-10.3	-11.1	-10.8	-11.6	-10.9	-11.5	-9.7	-10.3	-10.3	-11.3	-11.4	-11.8	-11.7	-11.5	-11.6	-11.7	-12.1	-11.5	-11.2	-11.4	-12.2	-11.6	-12.1
-9.3	-9.4	-9.5	-9.5	-9.6	-9.1	-8.9	-7.9	-8.1	-8.1	-8.6	-7.4	-9.9	-9.8	-9.9	-9.4	-9.3	-9.1	-8.6	-8.2	-8.3	-9.2	-9.4	-9.1	-9.3	-9.0	-9.1	-8.8	-8.7	-9.5	-8.1	-7.7	-8.1	-9.2	-9.3	-9.4
-5.4	-4.3	-4.8	-4.8	-5.4	-6.1	-6.5	-5.8	-5.4	-5.1	-4.1	-4.3	-5.8	-6.6	-6.4	-6.2	-5.4	-5.8	-4.8	-5.2	-5.3	-6.1	-6.0	-5.4	-5.6	-5.1	-5.3	-5.0	-4.7	-5.0	-4.9	-4.4	-3.9	-5.3	-5.6	-5.2
-1.7	-.5	-.7	-.5	-.8	-1.4	-2.1	-2.6	-2.1	-1.6	-.5	-.9	-1.1	-1.1	-.4	-.2	.2	-.9	-.4	-1.1	-1.3	-1.3	-1.0	-1.1	-1.1	-.6	-.7	-.3	.0	-.2	-.7	-1.1	-1.4	-1.7	-2.2	-1.3
2.1	2.7	3.0	2.8	2.8	2.7	2.6	1.7	1.7	1.9	2.2	2.8	3.6	4.3	4.6	4.6	4.6	4.5	3.9	3.3	3.2	3.2	3.2	3.3	3.9	4.5	5.0	5.2	5.1	4.9	4.0	3.2	2.8	2.4	1.7	1.9
6.8	7.2	7.0	6.3	5.9	5.9	5.9	5.7	5.7	5.9	6.2	7.7	9.0	9.6	9.5	8.9	8.8	8.4	7.9	7.7	7.6	8.1	9.3	11.0	10.8	10.6	11.6	12.2	11.9	11.0	10.8	11.1	9.5	8.4	7.1	6.6
11.9	11.5	11.2	11.1	11.4	11.7	11.5	11.2	12.2	12.3	12.3	13.7	13.2	13.6	13.8	14.9	16.2	18.8	20.5	21.7	22.1	23.3	24.6	24.0	21.2	21.4	24.2	25.7	24.9	24.4	24.1	22.8	21.2	19.5	18.2	12.9
16.7	16.0	15.6	16.1	16.3	16.9	17.9	19.6	19.9	18.7	17.9	17.4	17.8	18.3	19.1	20.2	21.3	22.4	23.4	24.3	25.1	26.1	27.3	27.9	28.1	28.1	27.9	27.5	26.6	26.0	24.9	23.7	22.5	21.0	18.3	17.2

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001

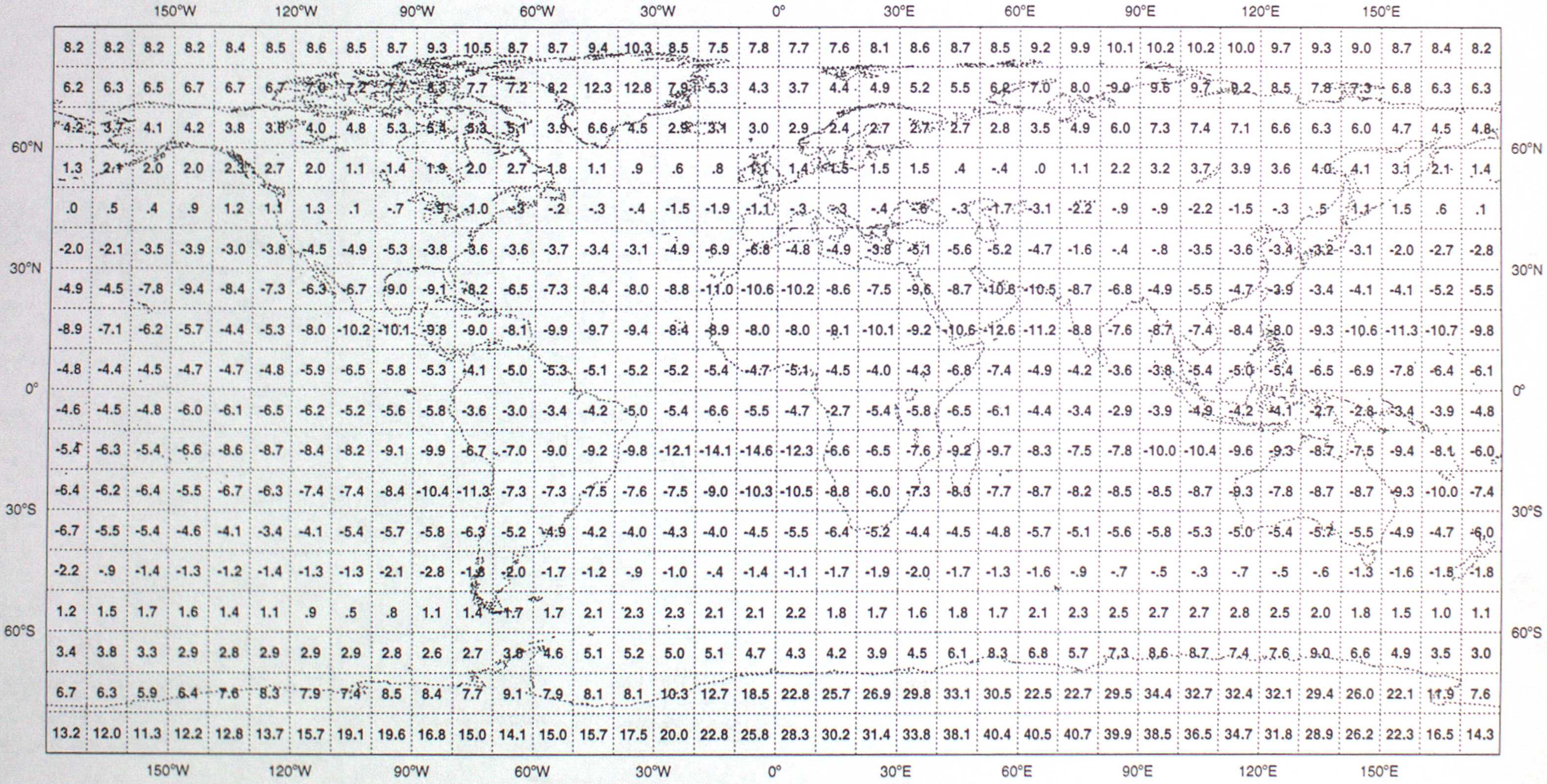
Channel: HIRS15 (700 hPa)

NOAA15, using all observations



2.8	2.8	2.7	2.8	2.8	2.9	2.9	3.0	3.2	3.3	3.3	3.6	3.7	3.7	3.6	3.7	3.7	3.7	3.8	3.9	3.8	3.7	3.5	3.3	2.9	2.6	2.5	2.5	2.5	2.5	2.6	2.7	2.8	2.9	2.9	2.9
2.9	2.6	2.6	2.9	3.0	3.0	2.7	2.7	2.7	2.7	2.8	3.2	4.1	4.1	3.8	3.8	3.7	3.5	3.1	3.7	4.0	4.0	3.8	3.6	3.2	2.8	2.4	2.3	2.3	2.4	2.6	2.9	3.2	3.5	3.5	3.3
3.5	3.2	3.4	3.3	3.4	3.7	3.8	3.6	3.6	3.4	3.2	3.3	3.5	4.2	4.8	4.6	3.6	3.2	3.2	3.6	4.2	4.5	4.6	4.2	3.9	3.7	3.4	3.3	3.3	3.5	3.6	3.6	3.7	4.3	4.4	4.1
3.5	2.9	2.8	2.9	3.5	3.4	3.7	4.2	4.3	4.5	3.9	3.0	3.1	3.3	3.5	3.6	3.2	2.9	3.1	3.8	4.2	3.9	3.8	3.7	3.9	4.3	4.1	3.6	3.9	4.3	4.2	3.4	3.1	3.1	3.2	3.4
3.7	3.4	3.5	3.5	3.6	3.9	4.2	4.3	4.5	4.4	4.3	3.9	4.0	3.7	3.4	3.5	3.6	3.3	3.5	3.9	4.1	3.6	3.4	3.7	4.0	4.1	5.0	5.0	5.4	5.0	4.0	3.6	3.6	3.7	3.9	4.3
3.4	3.4	3.5	3.5	3.6	4.1	4.6	4.3	4.2	4.4	4.3	3.9	4.0	3.6	3.3	3.2	3.7	3.7	3.8	3.8	4.3	4.2	4.3	3.7	3.9	6.0	5.3	4.7	4.5	4.3	4.0	4.0	4.0	3.9	4.1	4.1
3.5	3.3	3.5	3.3	3.5	3.6	3.8	3.5	4.0	3.7	3.5	3.6	3.5	3.5	3.5	3.2	3.8	4.1	4.1	4.6	4.8	4.1	3.8	3.9	4.0	4.0	5.8	4.8	3.8	3.8	3.7	3.7	3.5	3.5	3.4	3.7
3.5	3.3	3.5	3.3	3.4	3.3	3.4	3.4	3.6	3.4	3.4	3.4	3.3	3.3	3.4	3.3	3.6	3.8	3.9	4.0	4.7	4.0	3.6	3.4	3.5	3.5	3.5	3.5	3.5	3.5	3.3	3.4	3.3	3.4	3.4	3.4
3.4	3.2	3.4	3.3	3.3	3.3	3.3	3.4	3.4	3.3	3.2	3.5	3.3	3.3	3.3	3.4	3.2	3.6	3.3	3.5	4.0	3.6	3.4	3.4	3.5	3.4	3.4	3.4	3.3	3.4	3.3	3.2	3.3	3.4	3.4	3.4
3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.3	3.3	3.2	3.3	3.3	3.3	3.2	3.4	3.1	3.6	3.3	3.6	3.4	3.2	3.4	3.4	3.4	3.3	3.4	3.4	3.5	3.3	3.3	3.4	3.3	3.1	3.4	3.3
3.5	3.4	3.4	3.4	3.4	3.5	3.4	3.5	3.3	3.3	3.6	3.9	3.4	3.3	3.4	3.4	3.2	3.4	3.2	3.4	3.2	3.3	3.4	3.4	3.3	3.4	3.3	3.2	3.4	3.3	3.4	3.3	3.3	3.2	3.5	3.4
3.7	3.7	3.6	3.5	3.5	3.6	3.5	3.6	3.3	3.3	3.6	4.3	3.5	3.5	3.6	3.3	3.4	3.4	3.6	3.3	3.5	3.6	3.6	3.7	3.5	3.6	3.5	3.5	3.7	3.9	3.9	3.7	3.7	3.6	3.8	3.6
3.8	3.9	3.8	4.1	4.0	4.1	3.8	3.6	3.5	3.5	3.8	4.3	4.0	4.0	4.0	3.5	3.6	3.7	3.9	3.6	3.3	3.6	3.7	3.6	3.6	3.7	3.8	3.5	3.5	3.7	3.8	3.8	3.6	3.8	3.5	3.6
3.5	3.7	3.7	3.7	3.7	3.9	3.9	3.7	3.6	3.7	3.8	4.1	4.0	4.0	3.9	3.7	3.6	4.0	4.1	3.9	3.9	3.7	3.8	3.8	3.9	3.9	3.9	3.7	3.7	3.8	3.7	3.6	3.6	3.6	3.4	3.5
3.5	3.7	3.5	3.4	3.2	3.2	3.5	3.5	3.4	3.7	3.7	3.6	3.5	3.4	3.6	3.4	3.2	3.4	3.8	3.8	3.5	3.7	4.0	3.8	3.7	3.8	3.4	3.5	3.4	3.3	3.4	3.4	3.2	3.4	3.6	3.4
3.8	3.8	3.6	3.4	3.2	3.1	3.2	3.1	3.2	3.3	3.3	3.8	3.8	3.6	3.5	3.5	3.6	3.4	3.5	3.5	3.5	3.9	4.9	5.6	4.7	4.0	4.7	5.2	5.3	4.8	5.2	5.6	4.6	4.1	3.9	3.9
3.1	3.2	3.4	3.8	4.3	4.6	4.5	4.3	4.1	4.0	3.5	2.6	2.4	2.4	2.5	2.9	3.4	3.8	4.2	4.7	5.3	4.9	3.8	2.9	4.0	4.2	3.4	3.3	3.1	3.0	2.6	2.2	2.5	2.6	3.1	2.8
4.5	4.5	4.5	4.4	4.5	4.3	4.2	3.7	3.4	3.5	3.7	3.8	3.8	3.6	3.4	3.0	2.6	2.3	2.2	2.2	2.2	2.3	2.4	2.3	2.3	2.4	2.4	2.2	2.0	2.1	2.3	2.5	2.8	3.4	4.5	4.5

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations

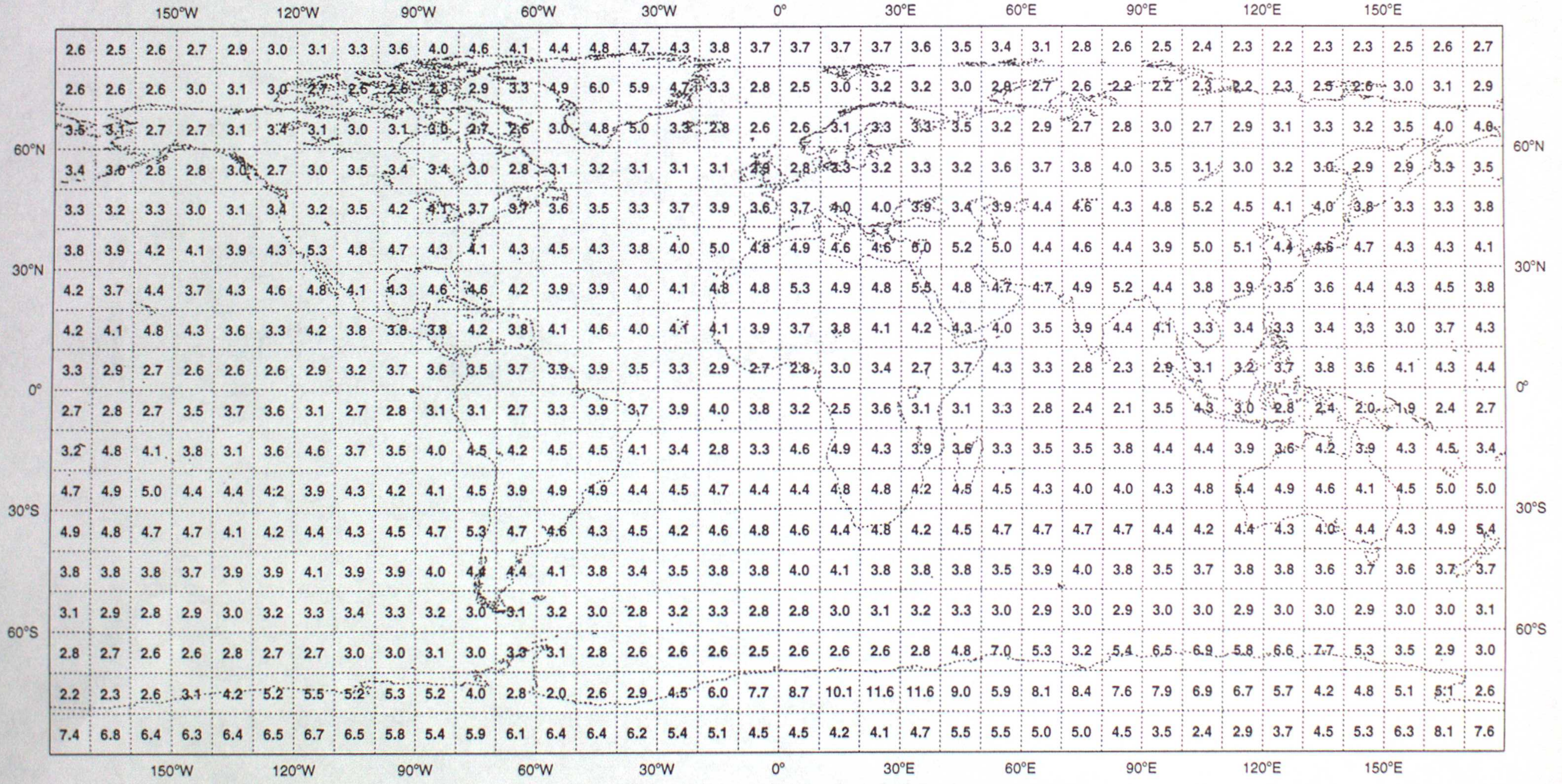


8.2	8.2	8.2	8.2	8.4	8.5	8.6	8.5	8.7	9.3	10.5	8.7	8.7	9.4	10.3	8.5	7.5	7.8	7.7	7.6	8.1	8.6	8.7	8.5	9.2	9.9	10.1	10.2	10.2	10.0	9.7	9.3	9.0	8.7	8.4	8.2
6.2	6.3	6.5	6.7	6.7	6.7	7.0	7.2	7.7	8.3	7.7	7.2	8.2	12.3	12.8	7.9	5.3	4.3	3.7	4.4	4.9	5.2	5.5	6.2	7.0	8.0	9.0	9.6	9.7	9.2	8.5	7.8	7.3	6.8	6.3	6.3
4.2	3.7	4.1	4.2	3.8	3.8	4.0	4.8	5.3	5.4	5.3	5.1	3.9	6.6	4.5	2.9	3.1	3.0	2.9	2.4	2.7	2.7	2.7	2.8	3.5	4.9	6.0	7.3	7.4	7.1	6.6	6.3	6.0	4.7	4.5	4.8
1.3	2.1	2.0	2.0	2.3	2.7	2.0	1.1	1.4	1.9	2.0	2.7	1.8	1.1	.9	.6	.8	1.1	1.4	1.5	1.5	1.5	.4	-.4	.0	1.1	2.2	3.2	3.7	3.9	3.6	4.0	4.1	3.1	2.1	1.4
.0	.5	.4	.9	1.2	1.1	1.3	.1	-.7	-.9	-1.0	-.3	-.2	-.3	-.4	-1.5	-1.9	-1.1	-.3	-.3	-.4	-.6	-.3	-1.7	-3.1	-2.2	-.9	-.9	-2.2	-1.5	-.3	.5	1.1	1.5	.6	.1
-2.0	-2.1	-3.5	-3.9	-3.0	-3.8	-4.5	-4.9	-5.3	-3.8	-3.6	-3.6	-3.7	-3.4	-3.1	-4.9	-6.9	-6.8	-4.8	-4.9	-3.8	-5.1	-5.6	-5.2	-4.7	-1.6	-.4	-.8	-3.5	-3.6	-3.4	-3.2	-3.1	-2.0	-2.7	-2.8
-4.9	-4.5	-7.8	-9.4	-8.4	-7.3	-6.3	-6.7	-9.0	-9.1	-8.2	-6.5	-7.3	-8.4	-8.0	-8.8	-11.0	-10.6	-10.2	-8.6	-7.5	-9.6	-8.7	-10.8	-10.5	-8.7	-6.8	-4.9	-5.5	-4.7	-3.9	-3.4	-4.1	-4.1	-5.2	-5.5
-8.9	-7.1	-6.2	-5.7	-4.4	-5.3	-8.0	-10.2	-10.1	-9.8	-9.0	-8.1	-9.9	-9.7	-9.4	-8.4	-8.9	-8.0	-8.0	-9.1	-10.1	-9.2	-10.6	-12.6	-11.2	-8.8	-7.6	-8.7	-7.4	-8.4	-8.0	-9.3	-10.6	-11.3	-10.7	-9.8
-4.8	-4.4	-4.5	-4.7	-4.7	-4.8	-5.9	-6.5	-5.8	-5.3	-4.1	-5.0	-5.3	-5.1	-5.2	-5.2	-5.4	-4.7	-5.1	-4.5	-4.0	-4.3	-6.8	-7.4	-4.9	-4.2	-3.6	-3.8	-5.4	-5.0	-5.4	-6.5	-6.9	-7.8	-6.4	-6.1
-4.6	-4.5	-4.8	-6.0	-6.1	-6.5	-6.2	-5.2	-5.6	-5.8	-3.6	-3.0	-3.4	-4.2	-5.0	-5.4	-6.6	-5.5	-4.7	-2.7	-5.4	-5.8	-6.5	-6.1	-4.4	-3.4	-2.9	-3.9	-4.9	-4.2	-4.1	-2.7	-2.8	-3.4	-3.9	-4.8
-5.4	-6.3	-5.4	-6.6	-8.6	-8.7	-8.4	-8.2	-9.1	-9.9	-6.7	-7.0	-9.0	-9.2	-9.8	-12.1	-14.1	-14.6	-12.3	-6.6	-6.5	-7.6	-9.2	-9.7	-8.3	-7.5	-7.8	-10.0	-10.4	-9.6	-9.3	-8.7	-7.5	-9.4	-8.1	-6.0
-6.4	-6.2	-6.4	-5.5	-6.7	-6.3	-7.4	-7.4	-8.4	-10.4	-11.3	-7.3	-7.3	-7.5	-7.6	-7.5	-9.0	-10.3	-10.5	-8.8	-6.0	-7.3	-8.3	-7.7	-8.7	-8.2	-8.5	-8.5	-8.7	-9.3	-7.8	-8.7	-8.7	-9.3	-10.0	-7.4
-6.7	-5.5	-5.4	-4.6	-4.1	-3.4	-4.1	-5.4	-5.7	-5.8	-6.3	-5.2	-4.9	-4.2	-4.0	-4.3	-4.0	-4.5	-5.5	-6.4	-5.2	-4.4	-4.5	-4.8	-5.7	-5.1	-5.6	-5.8	-5.3	-5.0	-5.4	-5.7	-5.5	-4.9	-4.7	-6.0
-2.2	-.9	-1.4	-1.3	-1.2	-1.4	-1.3	-1.3	-2.1	-2.8	-1.8	-2.0	-1.7	-1.2	-.9	-1.0	-.4	-1.4	-1.1	-1.7	-1.9	-2.0	-1.7	-1.3	-1.6	-.9	-.7	-.5	-.3	-.7	-.5	-.6	-1.3	-1.6	-1.8	-1.8
1.2	1.5	1.7	1.6	1.4	1.1	.9	.5	.8	1.1	1.4	1.7	1.7	2.1	2.3	2.3	2.1	2.1	2.2	1.8	1.7	1.6	1.8	1.7	2.1	2.3	2.5	2.7	2.7	2.8	2.5	2.0	1.8	1.5	1.0	1.1
3.4	3.8	3.3	2.9	2.8	2.9	2.9	2.9	2.8	2.6	2.7	3.8	4.6	5.1	5.2	5.0	5.1	4.7	4.3	4.2	3.9	4.5	6.1	8.3	6.8	5.7	7.3	8.6	8.7	7.4	7.6	9.0	6.6	4.9	3.5	3.0
6.7	6.3	5.9	6.4	7.6	8.3	7.9	7.4	8.5	8.4	7.7	9.1	7.9	8.1	8.1	10.3	12.7	18.5	22.8	25.7	26.9	29.8	33.1	30.5	22.5	22.7	29.5	34.4	32.7	32.4	32.1	29.4	26.0	22.1	11.9	7.6
13.2	12.0	11.3	12.2	12.8	13.7	15.7	19.1	19.6	16.8	15.0	14.1	15.0	15.7	17.5	20.0	22.8	25.8	28.3	30.2	31.4	33.8	38.1	40.4	40.5	40.7	39.9	38.5	36.5	34.7	31.8	28.9	26.2	22.3	16.5	14.3

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001

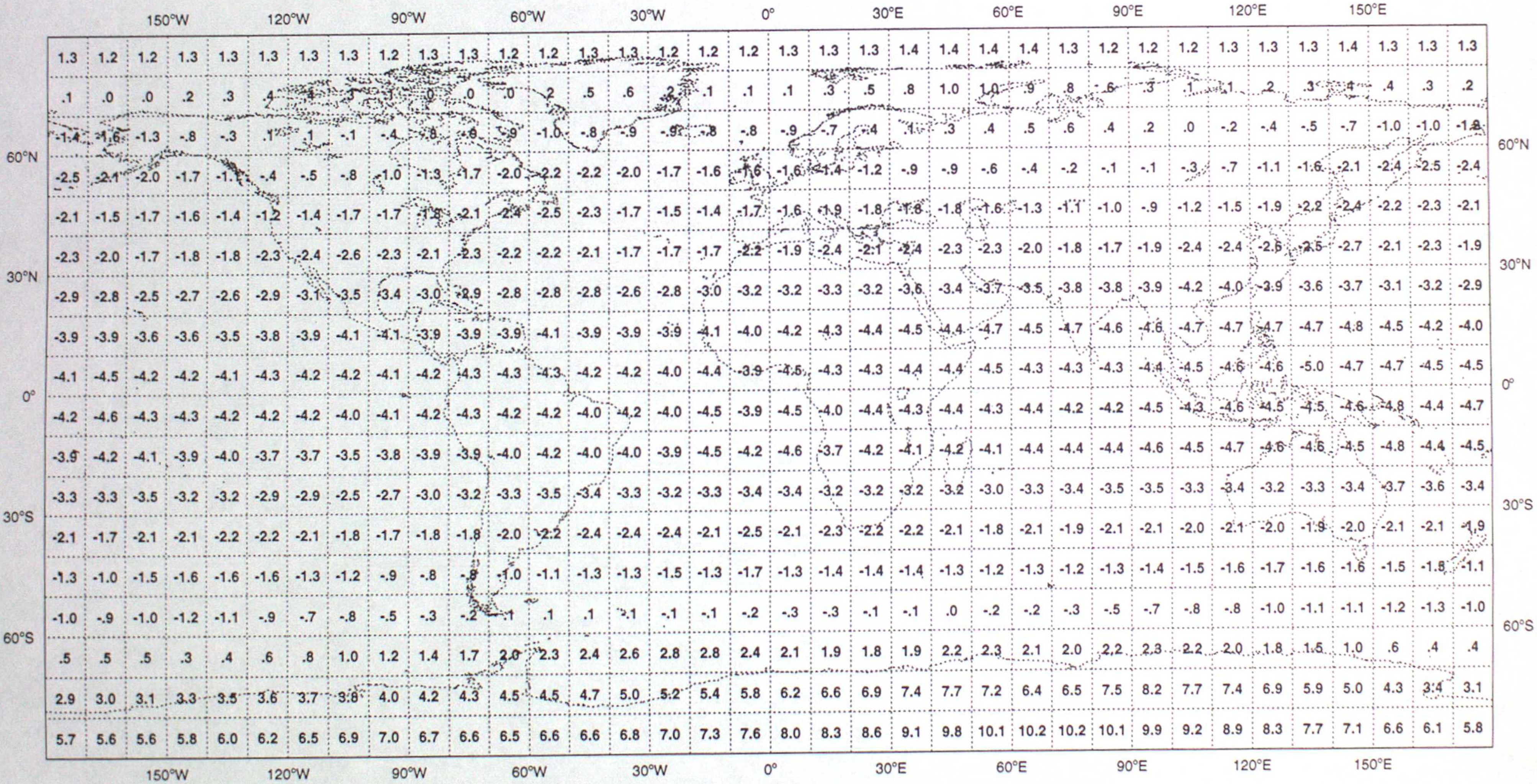
Channel: HIRS11 (500 - 700 hPa)

NOAA15, using all observations



2.6	2.5	2.6	2.7	2.9	3.0	3.1	3.3	3.6	4.0	4.6	4.1	4.4	4.8	4.7	4.3	3.8	3.7	3.7	3.7	3.7	3.6	3.5	3.4	3.1	2.8	2.6	2.5	2.4	2.3	2.2	2.3	2.3	2.5	2.6	2.7
2.6	2.6	2.6	3.0	3.1	3.0	2.7	2.6	2.6	2.8	2.9	3.3	4.9	6.0	5.9	4.7	3.3	2.8	2.5	3.0	3.2	3.2	3.0	2.8	2.7	2.6	2.2	2.2	2.3	2.2	2.3	2.5	2.6	3.0	3.1	2.9
3.5	3.1	2.7	2.7	3.1	3.4	3.1	3.0	3.1	3.0	2.7	2.6	3.0	4.8	5.0	3.3	2.8	2.6	2.6	3.1	3.3	3.3	3.5	3.2	2.9	2.7	2.8	3.0	2.7	2.9	3.1	3.3	3.2	3.5	4.0	4.8
3.4	3.0	2.8	2.8	3.0	2.7	3.0	3.5	3.4	3.4	3.0	2.8	3.1	3.2	3.1	3.1	3.1	2.9	2.8	3.3	3.2	3.3	3.2	3.6	3.7	3.8	4.0	3.5	3.1	3.0	3.2	3.0	2.9	2.9	3.3	3.5
3.3	3.2	3.3	3.0	3.1	3.4	3.2	3.5	4.2	4.1	3.7	3.7	3.6	3.5	3.3	3.7	3.9	3.6	3.7	4.0	4.0	3.9	3.4	3.9	4.4	4.6	4.3	4.8	5.2	4.5	4.1	4.0	3.8	3.3	3.3	3.8
3.8	3.9	4.2	4.1	3.9	4.3	5.3	4.8	4.7	4.3	4.1	4.3	4.5	4.3	3.8	4.0	5.0	4.8	4.9	4.6	4.6	6.0	5.2	5.0	4.4	4.6	4.4	3.9	5.0	5.1	4.4	4.6	4.7	4.3	4.3	4.1
4.2	3.7	4.4	3.7	4.3	4.6	4.8	4.1	4.3	4.6	4.6	4.2	3.9	3.9	4.0	4.1	4.8	4.8	5.3	4.9	4.8	5.5	4.8	4.7	4.7	4.9	5.2	4.4	3.8	3.9	3.5	3.6	4.4	4.3	4.5	3.8
4.2	4.1	4.8	4.3	3.6	3.3	4.2	3.8	3.8	3.8	4.2	3.8	4.1	4.6	4.0	4.1	4.1	3.9	3.7	3.8	4.1	4.2	4.3	4.0	3.5	3.9	4.4	4.1	3.3	3.4	3.3	3.4	3.3	3.0	3.7	4.3
3.3	2.9	2.7	2.6	2.6	2.6	2.9	3.2	3.7	3.6	3.5	3.7	3.9	3.9	3.5	3.3	2.9	2.7	2.8	3.0	3.4	2.7	3.7	4.3	3.3	2.8	2.3	2.9	3.1	3.2	3.7	3.8	3.6	4.1	4.3	4.4
2.7	2.8	2.7	3.5	3.7	3.6	3.1	2.7	2.8	3.1	3.1	2.7	3.3	3.9	3.7	3.9	4.0	3.8	3.2	2.5	3.6	3.1	3.1	3.3	2.8	2.4	2.1	3.5	4.3	3.0	2.8	2.4	2.0	1.9	2.4	2.7
3.2	4.8	4.1	3.8	3.1	3.6	4.6	3.7	3.5	4.0	4.5	4.2	4.5	4.5	4.1	3.4	2.8	3.3	4.6	4.9	4.3	3.9	3.6	3.3	3.5	3.5	3.8	4.4	4.4	3.9	3.6	4.2	3.9	4.3	4.5	3.4
4.7	4.9	5.0	4.4	4.4	4.2	3.9	4.3	4.2	4.1	4.5	3.9	4.9	4.9	4.4	4.5	4.7	4.4	4.4	4.8	4.8	4.2	4.5	4.5	4.3	4.0	4.0	4.3	4.8	5.4	4.9	4.6	4.1	4.5	5.0	5.0
4.9	4.8	4.7	4.7	4.1	4.2	4.4	4.3	4.5	4.7	5.3	4.7	4.6	4.3	4.5	4.2	4.6	4.8	4.6	4.4	4.8	4.2	4.5	4.7	4.7	4.7	4.7	4.4	4.2	4.4	4.3	4.0	4.4	4.3	4.9	5.4
3.8	3.8	3.8	3.7	3.9	3.9	4.1	3.9	3.9	4.0	4.4	4.4	4.1	3.8	3.4	3.5	3.8	3.8	4.0	4.1	3.8	3.8	3.8	3.5	3.9	4.0	3.8	3.5	3.7	3.8	3.8	3.6	3.7	3.6	3.7	3.7
3.1	2.9	2.8	2.9	3.0	3.2	3.3	3.4	3.3	3.2	3.0	3.1	3.2	3.0	2.8	3.2	3.3	2.8	2.8	3.0	3.1	3.2	3.3	3.0	2.9	3.0	2.9	3.0	3.0	2.9	3.0	3.0	2.9	3.0	3.0	3.1
2.8	2.7	2.6	2.6	2.8	2.7	2.7	3.0	3.0	3.1	3.0	3.3	3.1	2.8	2.6	2.6	2.6	2.5	2.6	2.6	2.6	2.8	4.8	7.0	5.3	3.2	5.4	6.5	6.9	5.8	6.6	7.7	5.3	3.5	2.9	3.0
2.2	2.3	2.6	3.1	4.2	5.2	5.5	5.2	5.3	5.2	4.0	2.8	2.0	2.6	2.9	4.5	6.0	7.7	8.7	10.1	11.6	11.6	9.0	5.9	8.1	8.4	7.6	7.9	6.9	6.7	5.7	4.2	4.8	5.1	5.1	2.6
7.4	6.8	6.4	6.3	6.4	6.5	6.7	6.5	5.8	5.4	5.9	6.1	6.4	6.4	6.2	5.4	5.1	4.5	4.5	4.2	4.1	4.7	5.5	5.5	5.0	5.0	4.5	3.5	2.4	2.9	3.7	4.5	5.3	6.3	8.1	7.6

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001
Channel: HIRS4 (400 hPa)
NOAA15, using all observations

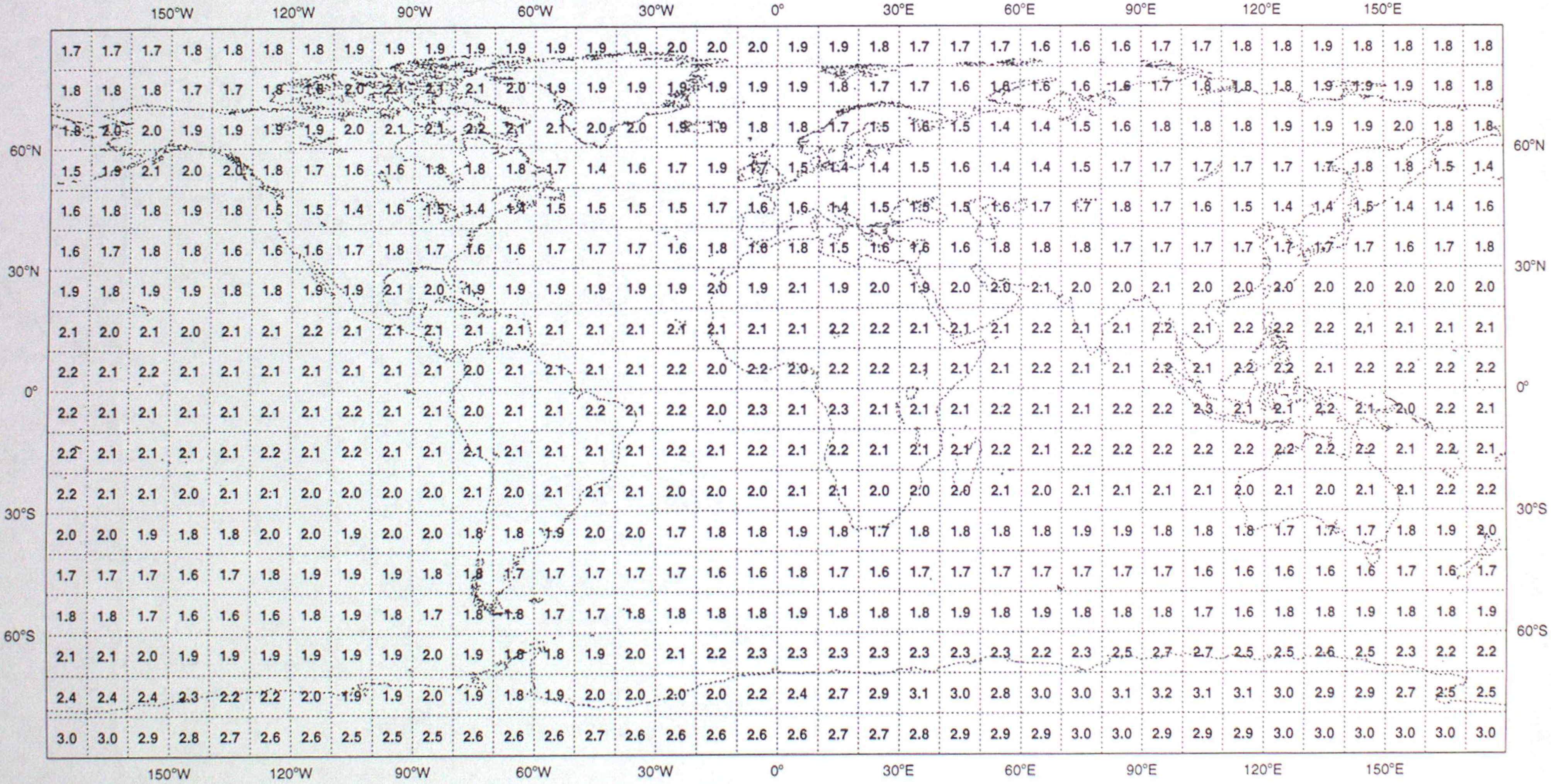


1.3	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.2	1.3	1.3	1.2	1.2	1.3	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.3	1.3	1.3
.1	.0	.0	.2	.3	.4	.4	.3	.1	.0	.0	.0	.2	.5	.6	.2	.1	.1	.1	.3	.5	.8	1.0	1.0	.9	.8	.6	.3	.1	.1	.2	.3	.4	.4	.3	.2
-1.4	-1.6	-1.3	-.8	-.3	.1	.1	-.1	-.4	-.8	-.8	-.9	-1.0	-.8	-.9	-.9	-.8	-.8	-.9	-.7	-.4	.1	.3	.4	.5	.6	.4	.2	.0	-.2	-.4	-.5	-.7	-1.0	-1.0	-1.8
-2.5	-2.1	-2.0	-1.7	-1.1	-.4	-.5	-.8	-1.0	-1.3	-1.7	-2.0	-2.2	-2.2	-2.0	-1.7	-1.6	-1.6	-1.6	-1.4	-1.2	-.9	-.9	-.6	-.4	-.2	-.1	-.1	-.3	-.7	-1.1	-1.6	-2.1	-2.4	-2.5	-2.4
-2.1	-1.5	-1.7	-1.6	-1.4	-1.2	-1.4	-1.7	-1.7	-1.8	-2.1	-2.4	-2.5	-2.3	-1.7	-1.5	-1.4	-1.7	-1.6	-1.9	-1.8	-1.8	-1.8	-1.6	-1.3	-1.1	-1.0	-.9	-1.2	-1.5	-1.9	-2.2	-2.4	-2.2	-2.3	-2.1
-2.3	-2.0	-1.7	-1.8	-1.8	-2.3	-2.4	-2.6	-2.3	-2.1	-2.3	-2.2	-2.2	-2.1	-1.7	-1.7	-1.7	-2.2	-1.9	-2.4	-2.1	-2.4	-2.3	-2.3	-2.0	-1.8	-1.7	-1.9	-2.4	-2.4	-2.6	-2.5	-2.7	-2.1	-2.3	-1.9
-2.9	-2.8	-2.5	-2.7	-2.6	-2.9	-3.1	-3.5	-3.4	-3.0	-2.9	-2.8	-2.8	-2.8	-2.6	-2.8	-3.0	-3.2	-3.2	-3.3	-3.2	-3.6	-3.4	-3.7	-3.5	-3.8	-3.8	-3.9	-4.2	-4.0	-3.9	-3.6	-3.7	-3.1	-3.2	-2.9
-3.9	-3.9	-3.6	-3.6	-3.5	-3.8	-3.9	-4.1	-4.1	-3.9	-3.9	-3.9	-4.1	-3.9	-3.9	-3.9	-4.1	-4.0	-4.2	-4.3	-4.4	-4.5	-4.4	-4.7	-4.5	-4.7	-4.6	-4.6	-4.7	-4.7	-4.7	-4.7	-4.8	-4.5	-4.2	-4.0
-4.1	-4.5	-4.2	-4.2	-4.1	-4.3	-4.2	-4.2	-4.1	-4.2	-4.3	-4.3	-4.3	-4.2	-4.2	-4.0	-4.4	-3.9	-4.5	-4.3	-4.3	-4.4	-4.4	-4.5	-4.3	-4.3	-4.3	-4.4	-4.5	-4.6	-4.6	-5.0	-4.7	-4.7	-4.5	-4.5
-4.2	-4.6	-4.3	-4.3	-4.2	-4.2	-4.2	-4.0	-4.1	-4.2	-4.3	-4.2	-4.2	-4.0	-4.2	-4.0	-4.5	-3.9	-4.5	-4.0	-4.4	-4.3	-4.4	-4.3	-4.4	-4.2	-4.2	-4.5	-4.3	-4.6	-4.5	-4.5	-4.6	-4.8	-4.4	-4.7
-3.9	-4.2	-4.1	-3.9	-4.0	-3.7	-3.7	-3.5	-3.8	-3.9	-3.9	-4.0	-4.2	-4.0	-4.0	-3.9	-4.5	-4.2	-4.6	-3.7	-4.2	-4.1	-4.2	-4.1	-4.4	-4.4	-4.4	-4.6	-4.5	-4.7	-4.6	-4.6	-4.5	-4.8	-4.4	-4.5
-3.3	-3.3	-3.5	-3.2	-3.2	-2.9	-2.9	-2.5	-2.7	-3.0	-3.2	-3.3	-3.5	-3.4	-3.3	-3.2	-3.3	-3.4	-3.4	-3.2	-3.2	-3.2	-3.2	-3.0	-3.3	-3.4	-3.5	-3.5	-3.3	-3.4	-3.2	-3.3	-3.4	-3.7	-3.6	-3.4
-2.1	-1.7	-2.1	-2.1	-2.2	-2.2	-2.1	-1.8	-1.7	-1.8	-1.8	-2.0	-2.2	-2.4	-2.4	-2.4	-2.1	-2.5	-2.1	-2.3	-2.2	-2.2	-2.1	-1.8	-2.1	-1.9	-2.1	-2.1	-2.0	-2.1	-2.0	-1.9	-2.0	-2.1	-2.1	-1.9
-1.3	-1.0	-1.5	-1.6	-1.6	-1.6	-1.3	-1.2	-.9	-.8	-.8	-1.0	-1.1	-1.3	-1.3	-1.5	-1.3	-1.7	-1.3	-1.4	-1.4	-1.4	-1.3	-1.2	-1.3	-1.2	-1.3	-1.4	-1.5	-1.6	-1.7	-1.6	-1.6	-1.5	-1.8	-1.1
-1.0	-.9	-1.0	-1.2	-1.1	-.9	-.7	-.8	-.5	-.3	-.2	.1	.1	.1	.1	-.1	-.1	-.2	-.3	-.3	-.1	-.1	.0	-.2	-.2	-.3	-.5	-.7	-.8	-.8	-1.0	-1.1	-1.1	-1.2	-1.3	-1.0
.5	.5	.5	.3	.4	.6	.8	1.0	1.2	1.4	1.7	2.0	2.3	2.4	2.6	2.8	2.8	2.4	2.1	1.9	1.8	1.9	2.2	2.3	2.1	2.0	2.2	2.3	2.2	2.0	1.8	1.5	1.0	.6	.4	.4
2.9	3.0	3.1	3.3	3.5	3.6	3.7	3.8	4.0	4.2	4.3	4.5	4.5	4.7	5.0	5.2	5.4	5.8	6.2	6.6	6.9	7.4	7.7	7.2	6.4	6.5	7.5	8.2	7.7	7.4	6.9	5.9	5.0	4.3	3.4	3.1
5.7	5.6	5.6	5.8	6.0	6.2	6.5	6.9	7.0	6.7	6.6	6.5	6.6	6.6	6.8	7.0	7.3	7.6	8.0	8.3	8.6	9.1	9.8	10.1	10.2	10.2	10.1	9.9	9.2	8.9	8.3	7.7	7.1	6.6	6.1	5.8

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001

Channel: HIRS4 (400 hPa)

NOAA15, using all observations



1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.0	2.0	2.0	1.9	1.9	1.8	1.7	1.7	1.7	1.6	1.6	1.6	1.7	1.7	1.8	1.8	1.9	1.8	1.8	1.8	1.8
1.8	1.8	1.8	1.7	1.7	1.8	1.8	2.0	2.1	2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.7	1.6	1.8	1.6	1.6	1.6	1.7	1.8	1.8	1.8	1.9	1.9	1.9	1.8	1.8
1.8	2.0	2.0	1.9	1.9	1.9	1.9	2.0	2.1	2.1	2.2	2.1	2.1	2.0	2.0	1.9	1.9	1.8	1.8	1.7	1.5	1.6	1.5	1.4	1.4	1.5	1.6	1.8	1.8	1.8	1.9	1.9	1.9	2.0	1.8	1.8
1.5	1.9	2.1	2.0	2.0	1.8	1.7	1.6	1.6	1.8	1.8	1.8	1.7	1.4	1.6	1.7	1.9	1.7	1.5	1.4	1.4	1.5	1.6	1.4	1.4	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.5	1.4
1.6	1.8	1.8	1.9	1.8	1.5	1.5	1.4	1.6	1.5	1.4	1.4	1.5	1.5	1.5	1.5	1.7	1.6	1.6	1.4	1.5	1.5	1.5	1.6	1.7	1.7	1.8	1.7	1.6	1.5	1.4	1.4	1.5	1.4	1.4	1.6
1.6	1.7	1.8	1.8	1.6	1.6	1.6	1.7	1.8	1.7	1.6	1.6	1.7	1.7	1.7	1.6	1.8	1.8	1.8	1.5	1.6	1.6	1.6	1.8	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.7	1.8
1.9	1.8	1.9	1.9	1.8	1.8	1.9	1.9	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	2.1	1.9	2.0	1.9	2.0	2.0	2.1	2.0	2.0	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
2.1	2.0	2.1	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.1	2.1	2.1	2.1
2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.1	2.1	2.1	2.1	2.2	2.0	2.2	2.0	2.2	2.2	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.1	2.2	2.2	2.1	2.2	2.2	2.2	2.2
2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.0	2.1	2.1	2.2	2.1	2.2	2.0	2.3	2.1	2.3	2.1	2.1	2.1	2.2	2.1	2.1	2.2	2.2	2.3	2.1	2.1	2.2	2.1	2.0	2.2	2.1
2.2	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.2	2.1	2.2	2.1	2.1	2.1	2.2	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.2	2.1
2.2	2.1	2.1	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.0	2.0	2.0	2.1	2.1	2.0	2.0	2.0	2.1	2.0	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.1	2.1	2.2	2.2
2.0	2.0	1.9	1.8	1.8	2.0	2.0	1.9	2.0	2.0	1.8	1.8	1.9	2.0	2.0	1.7	1.8	1.8	1.9	1.8	1.7	1.8	1.8	1.8	1.8	1.9	1.9	1.8	1.8	1.8	1.7	1.7	1.7	1.8	1.9	2.0
1.7	1.7	1.7	1.6	1.7	1.8	1.9	1.9	1.9	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.8	1.7	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.7	1.6	1.7
1.8	1.8	1.7	1.6	1.6	1.6	1.8	1.9	1.8	1.7	1.8	1.8	1.7	1.7	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.9	1.8	1.9	1.8	1.8	1.8	1.7	1.6	1.8	1.8	1.9	1.8	1.8	1.9
2.1	2.1	2.0	1.9	1.9	1.9	1.9	1.9	1.9	2.0	1.9	1.8	1.8	1.9	2.0	2.1	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.3	2.5	2.7	2.7	2.5	2.5	2.6	2.5	2.3	2.2	2.2
2.4	2.4	2.4	2.3	2.2	2.2	2.0	1.9	1.9	2.0	1.9	1.8	1.9	2.0	2.0	2.0	2.0	2.2	2.4	2.7	2.9	3.1	3.0	2.8	3.0	3.0	3.1	3.2	3.1	3.1	3.0	2.9	2.9	2.7	2.5	2.5
3.0	3.0	2.9	2.8	2.7	2.6	2.6	2.5	2.5	2.5	2.6	2.6	2.6	2.7	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.8	2.9	2.9	2.9	3.0	3.0	2.9	2.9	2.9	3.0	3.0	3.0	3.0	3.0	3.0

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

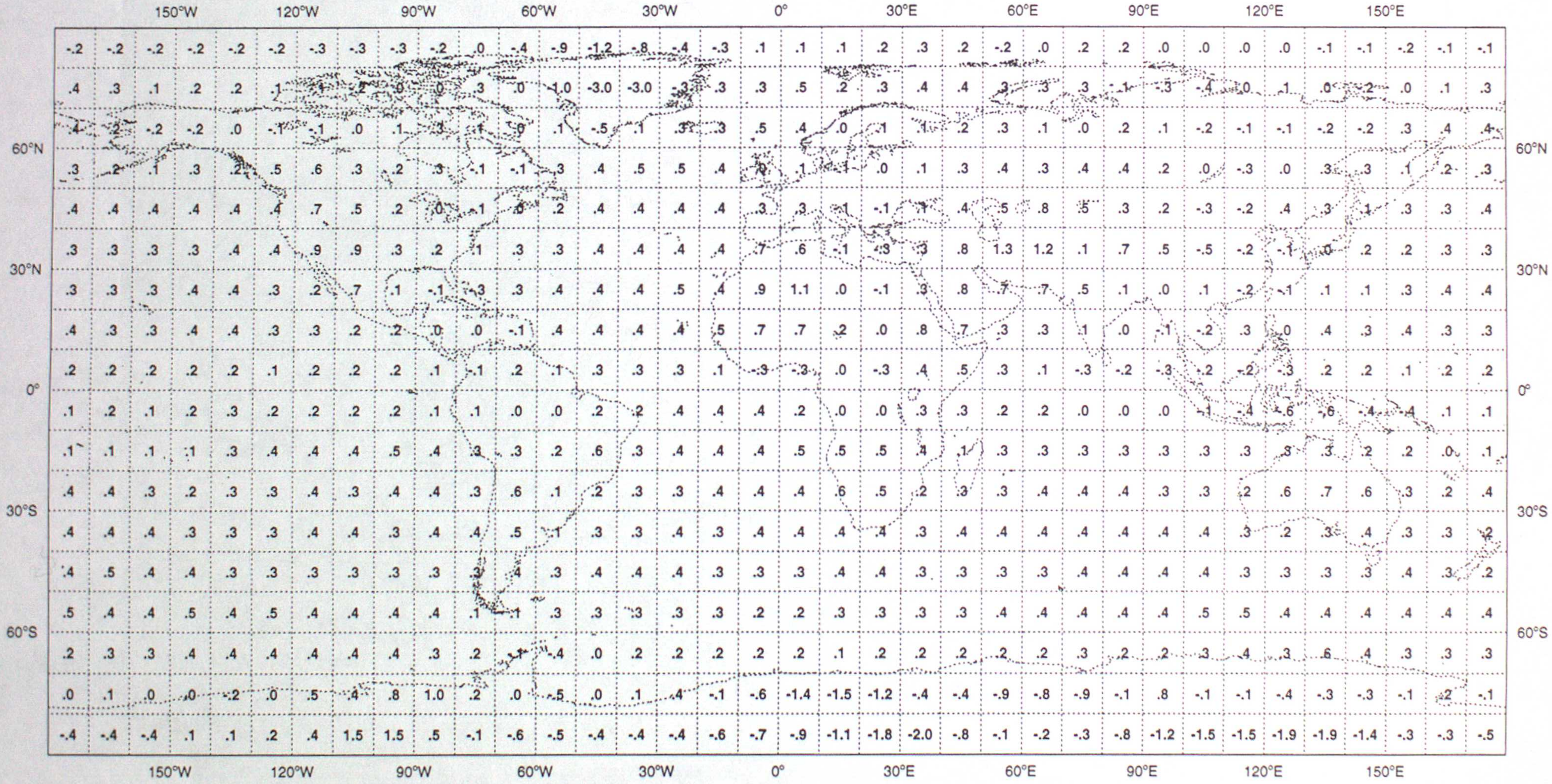
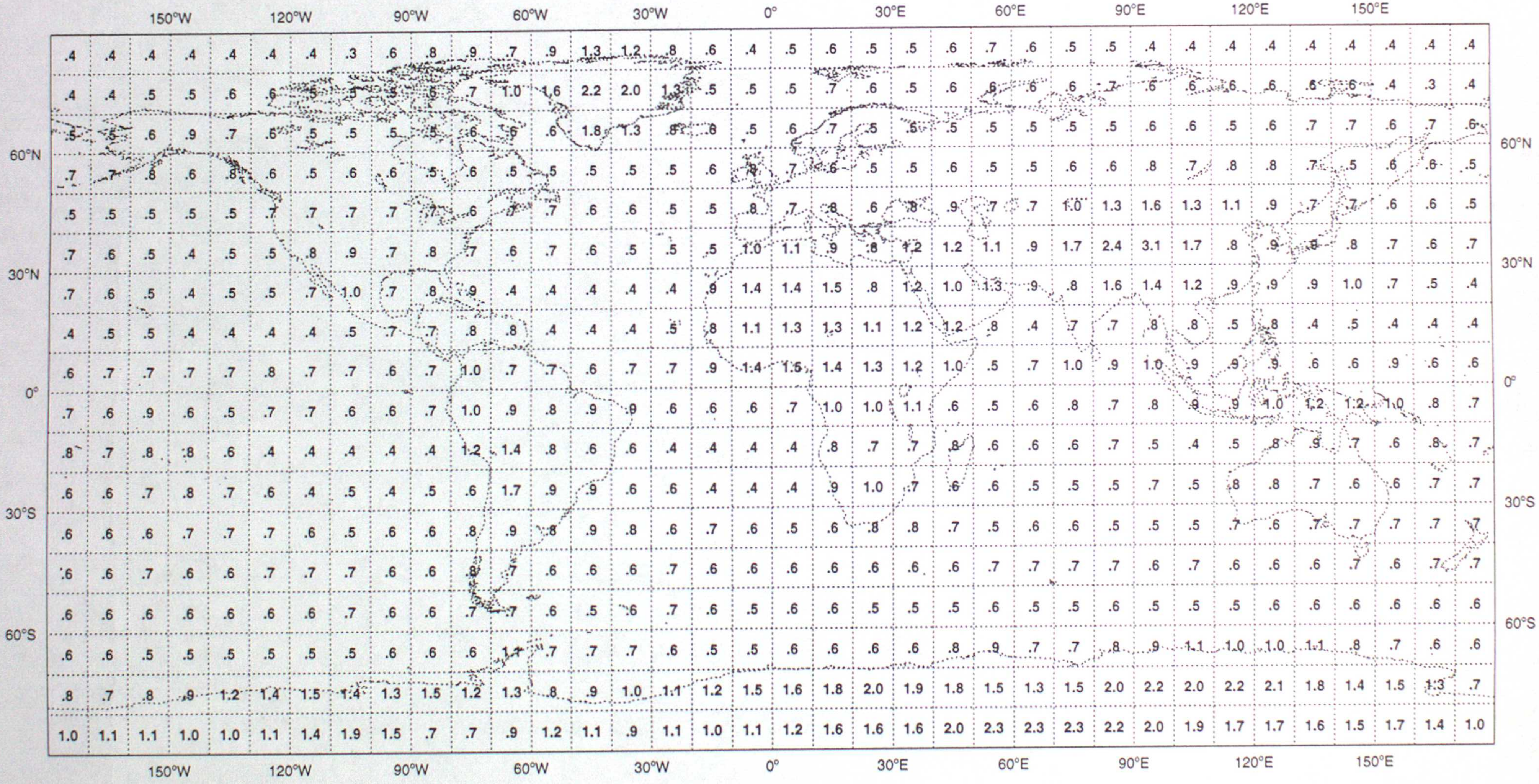

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-.2 -.2 -.2 -.2 -.2 -.2 -.3 -.3 -.3 -.2 .0 -.4 -.9 -1.2 -.8 -.4 -.3 .1 .1 .1 .2 .3 .2 -.2 .0 .2 .2 .0 .0 .0 .0 -.1 -.1 -.2 -.1 -.1
.4 .3 .1 .2 .2 .1 .1 .2 .0 .0 .3 .0 -1.0 -3.0 -3.0 -.3 .3 .3 .5 .2 .3 .4 .4 .3 .3 .3 -.1 -.3 -.4 .0 .1 .0 -.2 .0 .1 .3
.4 .2 -.2 -.2 .0 -.1 -.1 .0 .1 .3 .1 .0 .1 -.5 .1 .3 .3 .5 .4 .0 .1 .1 .2 .3 .1 .0 .2 .1 -.2 -.1 -.1 -.2 -.2 .3 .4 .4
.3 .2 .1 .3 .2 .5 .6 .3 .2 .3 -.1 -.1 .3 .4 .5 .5 .4 .0 .1 -.1 .0 .1 .3 .4 .3 .4 .4 .2 .0 -.3 .0 .3 .3 .1 .2 .3
.4 .4 .4 .4 .4 .4 .7 .5 .2 .0 -.1 .0 .2 .4 .4 .4 .4 .3 .3 -.1 -.1 .1 .4 .5 .8 .5 .3 .2 -.3 -.2 .4 .3 .1 .3 .3 .4
.3 .3 .3 .3 .4 .4 .9 .9 .3 .2 .1 .3 .3 .4 .4 .4 .4 .7 .6 -.1 .3 .3 .8 1.3 1.2 .1 .7 .5 -.5 -.2 -.1 .0 .2 .2 .3 .3
.3 .3 .3 .4 .4 .3 .2 .7 .1 -.1 -.3 .3 .4 .4 .4 .5 .4 .9 1.1 .0 -.1 .3 .8 .7 .7 .5 .1 .0 .1 -.2 -.1 .1 .1 .3 .4 .4
.4 .3 .3 .4 .4 .3 .3 .2 .2 .0 .0 -.1 .4 .4 .4 .4 .5 .7 .7 .2 .0 .8 .7 .3 .3 .1 .0 -.1 -.2 .3 .0 .4 .3 .4 .3 .3
.2 .2 .2 .2 .2 .1 .2 .2 .2 .1 -.1 .2 .1 .3 .3 .3 .1 -.3 -.3 .0 -.3 .4 .5 .3 .1 -.3 -.2 -.3 -.2 -.2 -.3 .2 .2 .1 .2 .2
.1 .2 .1 .2 .3 .2 .2 .2 .2 .1 .1 .0 .0 .2 .2 .4 .4 .4 .2 .0 .0 .3 .3 .2 .2 .0 .0 .0 -.1 -.4 -.6 -.6 -.4 -.4 .1 .1
.1 .1 .1 .1 .3 .4 .4 .4 .5 .4 .3 .3 .2 .6 .3 .4 .4 .4 .5 .5 .5 .4 .1 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .0 .1
.4 .4 .3 .2 .3 .3 .4 .3 .4 .4 .3 .6 .1 .2 .3 .3 .4 .4 .4 .6 .5 .2 .3 .3 .4 .4 .4 .3 .3 .2 .6 .7 .6 .3 .2 .4
.4 .4 .4 .3 .3 .3 .4 .4 .3 .4 .4 .5 .1 .3 .3 .4 .3 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .2 .3 .4 .3 .3 .2
.4 .5 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .4 .3 .3 .3 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .4 .3 .2
.5 .4 .4 .5 .4 .5 .4 .4 .4 .4 .1 .1 .3 .3 .3 .3 .3 .2 .2 .3 .3 .3 .3 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4
.2 .3 .3 .4 .4 .4 .4 .4 .4 .3 .2 -.1 -.4 .0 .2 .2 .2 .2 .2 .1 .2 .2 .2 .2 .2 .3 .2 .2 .3 .4 .3 .6 .4 .3 .3 .3
.0 .1 .0 .0 -.2 .0 .5 .4 .8 1.0 .2 .0 -.5 .0 .1 .4 -.1 -.6 -1.4 -1.5 -1.2 -.4 -.4 -.9 -.8 -.9 -.1 .8 -.1 -.1 -.4 -.3 -.3 -.1 .2 -.1
-.4 -.4 -.4 .1 .1 .2 .4 1.5 1.5 .5 -.1 -.6 -.5 -.4 -.4 -.4 -.6 -.7 -.9 -1.1 -1.8 -2.0 -.8 -.1 -.2 -.3 -.8 -1.2 -1.5 -1.5 -1.9 -1.9 -1.4 -.3 -.3 -.5

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001

Channel: AMSUA-5 (700 hPa)

NOAA15, using all observations



.4	.4	.4	.4	.4	.4	.4	.3	.6	.8	.9	.7	.9	1.3	1.2	.8	.6	.4	.5	.6	.5	.5	.6	.7	.6	.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.5	.5	.6	.6	.5	.5	.5	.6	.7	1.0	1.6	2.2	2.0	1.3	.5	.5	.5	.7	.6	.5	.6	.6	.6	.6	.7	.6	.6	.6	.6	.6	.6	.4	.3	.4
.5	.5	.6	.9	.7	.6	.5	.5	.5	.5	.6	.6	.6	1.8	1.3	.8	.8	.5	.6	.7	.5	.5	.5	.5	.5	.5	.5	.6	.6	.5	.6	.7	.7	.6	.7	.6
.7	.7	.8	.6	.8	.6	.5	.6	.6	.5	.6	.5	.5	.5	.5	.5	.6	.8	.7	.6	.5	.5	.6	.5	.5	.6	.6	.8	.7	.8	.8	.7	.5	.6	.6	.5
.5	.5	.5	.5	.5	.7	.7	.7	.7	.7	.6	.7	.7	.6	.6	.5	.5	.8	.7	.8	.6	.8	.9	.7	.7	1.0	1.3	1.6	1.3	1.1	.9	.7	.7	.6	.6	.5
.7	.6	.5	.4	.5	.5	.8	.9	.7	.8	.7	.6	.7	.6	.5	.5	.5	1.0	1.1	.9	.8	1.2	1.2	1.1	.9	1.7	2.4	3.1	1.7	.8	.9	.8	.8	.7	.6	.7
.7	.6	.5	.4	.5	.5	.7	1.0	.7	.8	.9	.4	.4	.4	.4	.4	.8	1.4	1.4	1.5	.8	1.2	1.0	1.3	.9	.8	1.6	1.4	1.2	.9	.9	.9	1.0	.7	.5	.4
.4	.5	.5	.4	.4	.4	.4	.5	.7	.7	.8	.8	.4	.4	.4	.5	.8	1.1	1.3	1.3	1.1	1.2	1.2	.8	.4	.7	.7	.8	.8	.5	.8	.4	.5	.4	.4	.4
.6	.7	.7	.7	.7	.8	.7	.7	.6	.7	1.0	.7	.7	.6	.7	.7	.9	1.4	1.5	1.4	1.3	1.2	1.0	.5	.7	1.0	.9	1.0	.9	.9	.9	.6	.6	.9	.6	.6
.7	.6	.9	.6	.5	.7	.7	.6	.6	.7	1.0	.9	.8	.9	.9	.6	.6	.6	.7	1.0	1.0	1.1	.6	.5	.6	.8	.7	.8	.9	.9	1.0	1.2	1.2	1.0	.8	.7
.8	.7	.8	.8	.6	.4	.4	.4	.4	.4	1.2	1.4	.8	.6	.6	.4	.4	.4	.4	.8	.7	.7	.8	.6	.6	.6	.7	.5	.4	.5	.8	.9	.7	.6	.8	.7
.6	.6	.7	.8	.7	.6	.4	.5	.4	.5	.6	1.7	.9	.9	.6	.6	.4	.4	.4	.9	1.0	.7	.6	.6	.5	.5	.5	.7	.5	.8	.8	.7	.6	.6	.7	.7
.6	.6	.6	.7	.7	.7	.6	.5	.6	.6	.8	.9	.8	.9	.8	.6	.7	.6	.5	.6	.8	.8	.7	.5	.6	.6	.5	.5	.5	.7	.6	.7	.7	.7	.7	.7
.6	.6	.7	.6	.6	.7	.7	.7	.6	.6	.8	.7	.6	.6	.6	.7	.6	.6	.6	.6	.6	.6	.6	.7	.7	.7	.7	.6	.7	.6	.6	.6	.7	.6	.7	.7
.6	.6	.6	.6	.6	.6	.6	.7	.6	.6	.7	.7	.6	.5	.6	.7	.6	.5	.6	.6	.5	.5	.5	.6	.5	.5	.6	.5	.5	.5	.6	.6	.6	.6	.6	.6
.6	.6	.5	.5	.5	.5	.5	.5	.6	.6	.6	1.1	.7	.7	.7	.6	.5	.5	.6	.6	.6	.6	.8	.9	.7	.7	.8	.9	1.1	1.0	1.0	1.1	.8	.7	.6	.6
.8	.7	.8	.9	1.2	1.4	1.5	1.4	1.3	1.5	1.2	1.3	.8	.9	1.0	1.1	1.2	1.5	1.6	1.8	2.0	1.9	1.8	1.5	1.3	1.5	2.0	2.2	2.0	2.2	2.1	1.8	1.4	1.5	1.3	.7
1.0	1.1	1.1	1.0	1.0	1.1	1.4	1.9	1.5	.7	.7	.9	1.2	1.1	.9	1.1	1.0	1.1	1.2	1.6	1.6	1.6	2.0	2.3	2.3	2.3	2.2	2.0	1.9	1.7	1.7	1.6	1.5	1.7	1.4	1.0

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

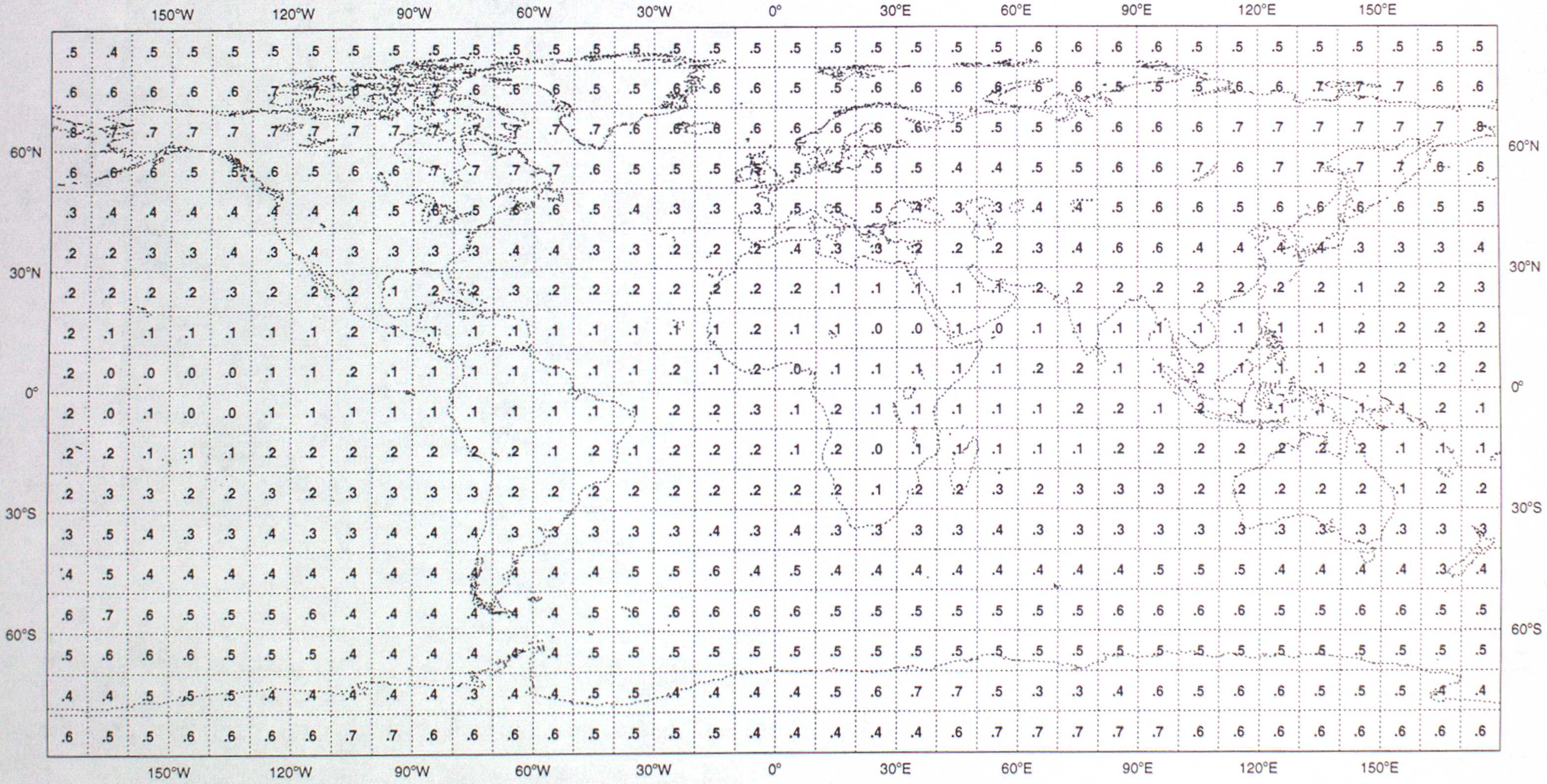

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5
.6 .6 .6 .6 .6 .7 .7 .6 .7 .7 .6 .6 .6 .5 .5 .6 .6 .6 .5 .5 .6 .6 .6 .6 .6 .6 .5 .5 .5 .6 .6 .7 .7 .7 .6 .6
.8 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .6 .6 .8 .6 .6 .6 .6 .6 .5 .5 .5 .6 .6 .6 .6 .7 .7 .7 .7 .7 .7 .8
.6 .6 .6 .5 .5 .6 .5 .6 .6 .7 .7 .7 .7 .6 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .5 .5 .6 .6 .7 .6 .7 .7 .7 .7 .6 .6
.3 .4 .4 .4 .4 .4 .4 .4 .5 .6 .5 .6 .6 .5 .4 .3 .3 .3 .5 .5 .5 .4 .3 .3 .4 .4 .5 .6 .6 .5 .6 .6 .6 .6 .5 .5
.2 .2 .3 .3 .4 .3 .4 .3 .3 .3 .3 .4 .4 .3 .3 .2 .2 .2 .4 .3 .3 .2 .2 .2 .3 .4 .6 .6 .4 .4 .4 .4 .3 .3 .3 .4
.2 .2 .2 .2 .3 .2 .2 .2 .1 .2 .2 .3 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .1 .1 .2 .2 .2 .2 .2 .2 .2 .2 .1 .2 .2 .3
.2 .1 .1 .1 .1 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1 .0 .0 .1 .0 .1 .1 .1 .1 .1 .1 .1 .1 .2 .2 .2 .2
.2 .0 .0 .0 .0 .1 .1 .2 .1 .1 .1 .1 .1 .1 .1 .2 .1 .2 .0 .1 .1 .1 .1 .1 .2 .2 .1 .1 .2 .1 .1 .1 .2 .2 .2 .2
.2 .0 .1 .0 .0 .1 .1 .1 .1 .1 .1 .1 .1 .1 .1 .2 .2 .3 .1 .2 .1 .1 .1 .1 .1 .2 .2 .1 .2 .1 .1 .1 .1 .1 .2 .1
.2 .2 .1 .1 .1 .2 .2 .2 .2 .2 .2 .2 .1 .2 .1 .2 .2 .2 .1 .2 .0 .1 .1 .1 .1 .1 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1
.2 .3 .3 .2 .2 .3 .2 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .2 .2 .3 .2 .3 .3 .3 .2 .2 .2 .2 .2 .1 .2 .2
.3 .5 .4 .3 .3 .4 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .4 .3 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .6 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .4 .4 .4 .4 .3 .4
.6 .7 .6 .5 .5 .5 .6 .4 .4 .4 .4 .4 .4 .5 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .5 .5 .6 .6 .5 .5
.5 .6 .6 .6 .5 .5 .5 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.4 .4 .5 .5 .5 .4 .4 .4 .4 .4 .3 .4 .4 .5 .5 .4 .4 .4 .4 .5 .6 .7 .7 .5 .3 .3 .4 .6 .5 .6 .6 .5 .5 .5 .4 .4
.6 .5 .5 .6 .6 .6 .6 .7 .7 .6 .6 .6 .6 .5 .5 .5 .5 .4 .4 .4 .4 .4 .6 .7 .7 .7 .7 .7 .6 .6 .6 .6 .6 .6 .6 .6

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001

Channel: AMSUA-7 (300 hPa)

NOAA15, using all observations

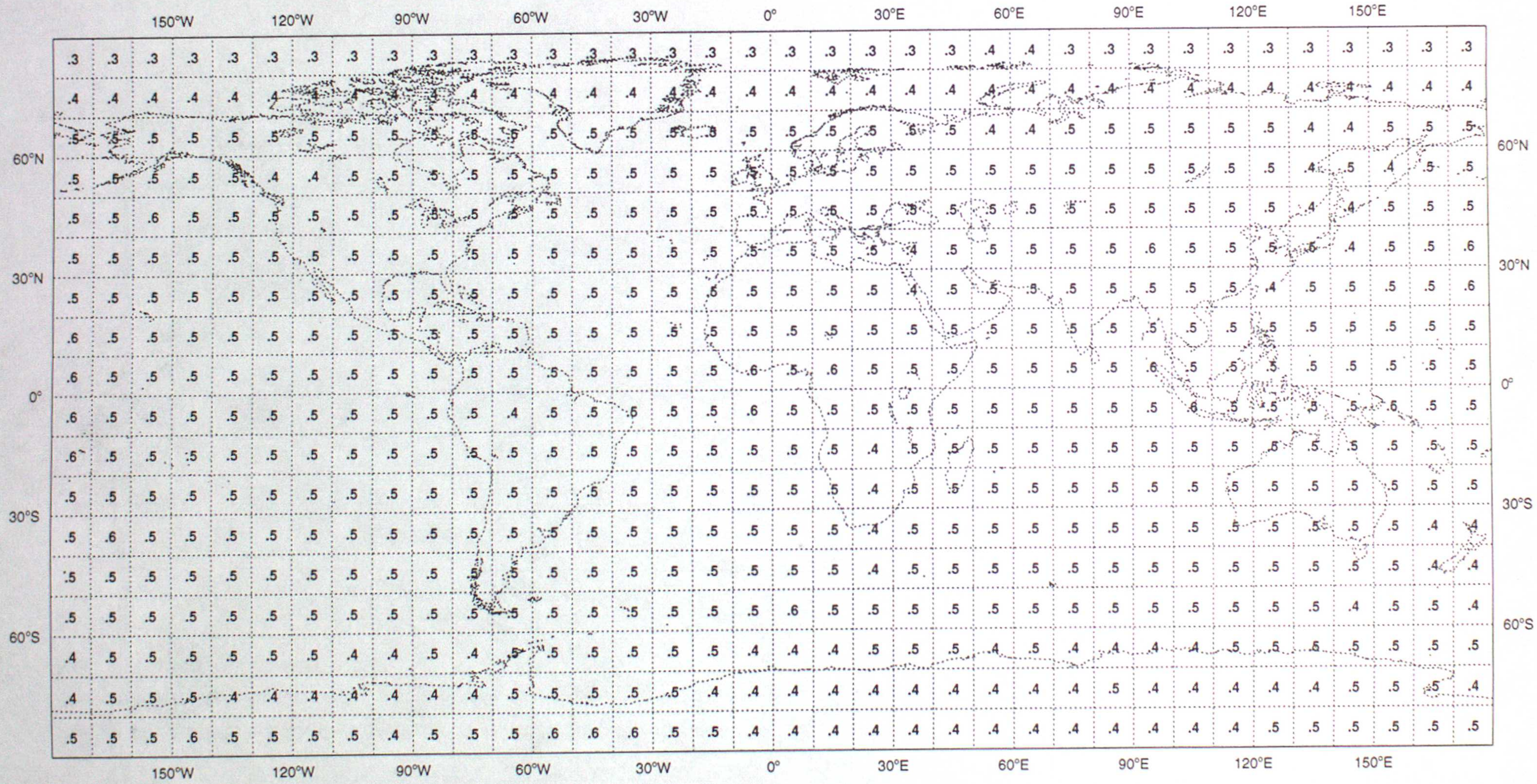
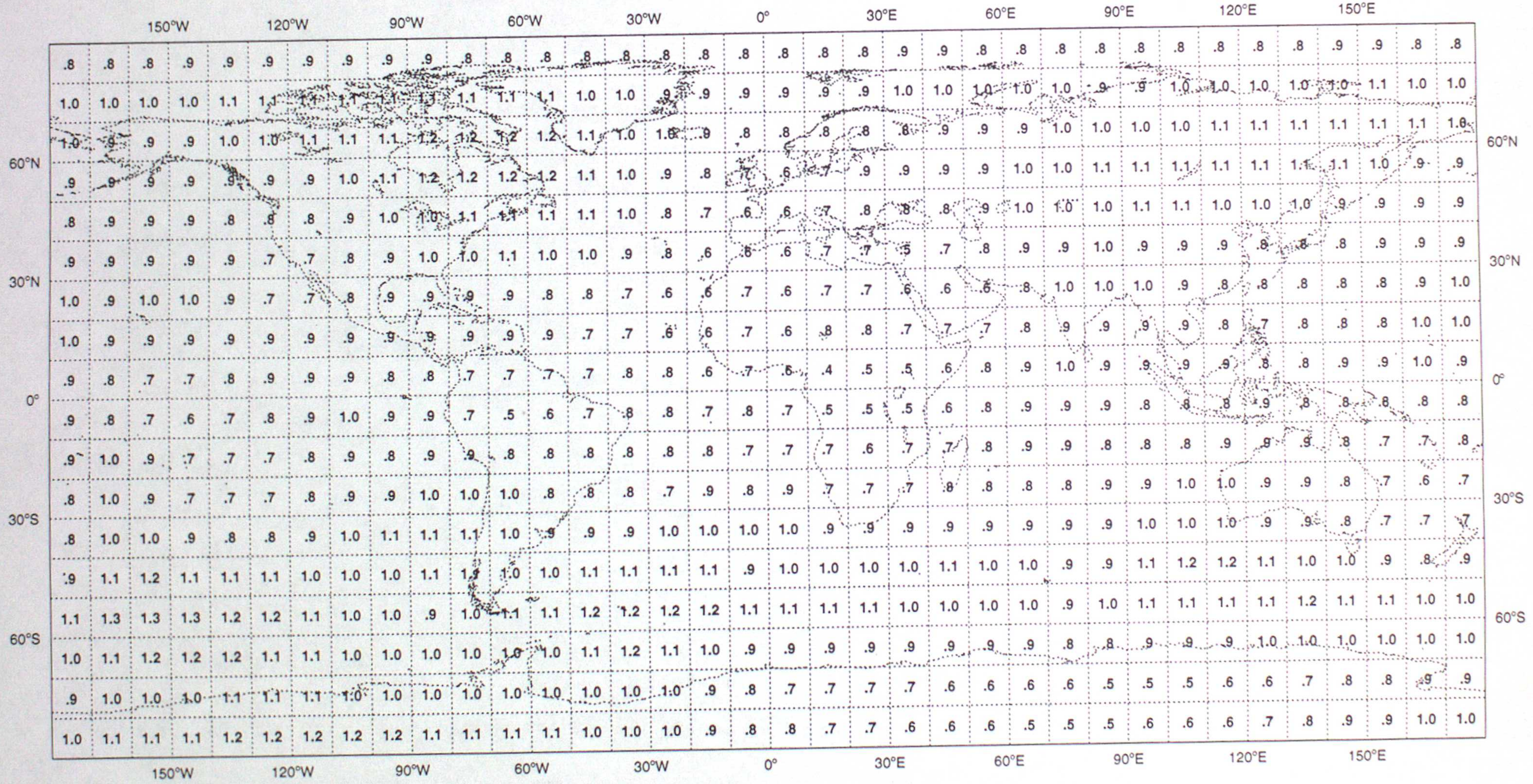

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations



.8	.8	.8	.9	.9	.9	.9	.9	.9	.9	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.9	.9	.8	.8	.8	.8	.8	.8	.8	.8	.8	.9	.9	.8	.8
1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	.9	.9	.9	.9	.9	.9	1.0	1.0	1.0	1.0	1.0	.9	.9	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0
1.0	.9	.9	.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.1	1.0	1.0	.9	.8	.8	.8	.8	.8	.9	.9	.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.0
.9	.9	.9	.9	.9	.9	.9	1.0	1.1	1.2	1.2	1.2	1.2	1.1	1.0	.9	.8	.7	.6	.7	.9	.9	.9	.9	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	.9	.9
.8	.9	.9	.9	.8	.8	.8	.9	1.0	1.0	1.1	1.1	1.1	1.1	1.0	.8	.7	.6	.6	.7	.8	.8	.8	.9	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.0	.9	.9	.9	.9
.9	.9	.9	.9	.9	.7	.7	.8	.9	1.0	1.0	1.1	1.0	1.0	.9	.8	.6	.6	.6	.7	.7	.5	.7	.8	.9	.9	1.0	.9	.9	.9	.8	.8	.8	.9	.9	.9
1.0	.9	1.0	1.0	.9	.7	.7	.8	.9	.9	.9	.9	.8	.8	.7	.6	.6	.7	.6	.7	.7	.6	.6	.6	.8	1.0	1.0	1.0	.9	.8	.8	.8	.8	.8	.9	1.0
1.0	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.9	.7	.7	.6	.6	.7	.6	.8	.8	.7	.7	.7	.8	.9	.9	.9	.9	.8	.7	.8	.8	.8	1.0	1.0
.9	.8	.7	.7	.8	.9	.9	.9	.8	.8	.7	.7	.7	.7	.8	.8	.6	.7	.6	.4	.5	.5	.6	.8	.9	1.0	.9	.9	.9	.9	.8	.8	.9	.9	1.0	.9
.9	.8	.7	.6	.7	.8	.9	1.0	.9	.9	.7	.5	.6	.7	.8	.8	.7	.8	.7	.5	.5	.5	.6	.8	.9	.9	.9	.8	.8	.8	.9	.8	.8	.8	.8	.8
.9	1.0	.9	.7	.7	.7	.8	.9	.8	.9	.9	.8	.8	.8	.8	.8	.8	.7	.7	.7	.6	.7	.7	.8	.9	.9	.8	.8	.8	.9	.9	.9	.8	.7	.7	.8
.8	1.0	.9	.7	.7	.7	.8	.9	.9	1.0	1.0	1.0	.8	.8	.8	.7	.9	.8	.9	.7	.7	.7	.8	.8	.8	.8	.9	.9	1.0	1.0	.9	.9	.8	.7	.6	.7
.8	1.0	1.0	.9	.8	.8	.9	1.0	1.1	1.1	1.1	1.0	.9	.9	.9	1.0	1.0	1.0	1.0	.9	.9	.9	.9	.9	.9	.9	.9	1.0	1.0	1.0	.9	.9	.8	.7	.7	.7
.9	1.1	1.2	1.1	1.1	1.1	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.1	.9	1.0	1.0	1.0	1.0	1.1	1.0	1.0	.9	.9	1.1	1.2	1.2	1.1	1.0	1.0	.9	.8	.9
1.1	1.3	1.3	1.3	1.2	1.2	1.1	1.0	1.0	.9	1.0	1.1	1.1	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	.9	1.0	1.1	1.1	1.1	1.1	1.2	1.1	1.1	1.0	1.0
1.0	1.1	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.1	1.0	.9	.9	.9	.9	.9	.9	.9	.9	.8	.8	.9	.9	.9	1.0	1.0	1.0	1.0	1.0	1.0
.9	1.0	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	.9	.8	.7	.7	.7	.7	.6	.6	.6	.6	.5	.5	.5	.6	.6	.7	.8	.8	.9	.9
1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.0	1.0	.9	.8	.8	.7	.7	.6	.6	.6	.5	.5	.5	.6	.6	.6	.7	.8	.9	.9	1.0	1.0

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

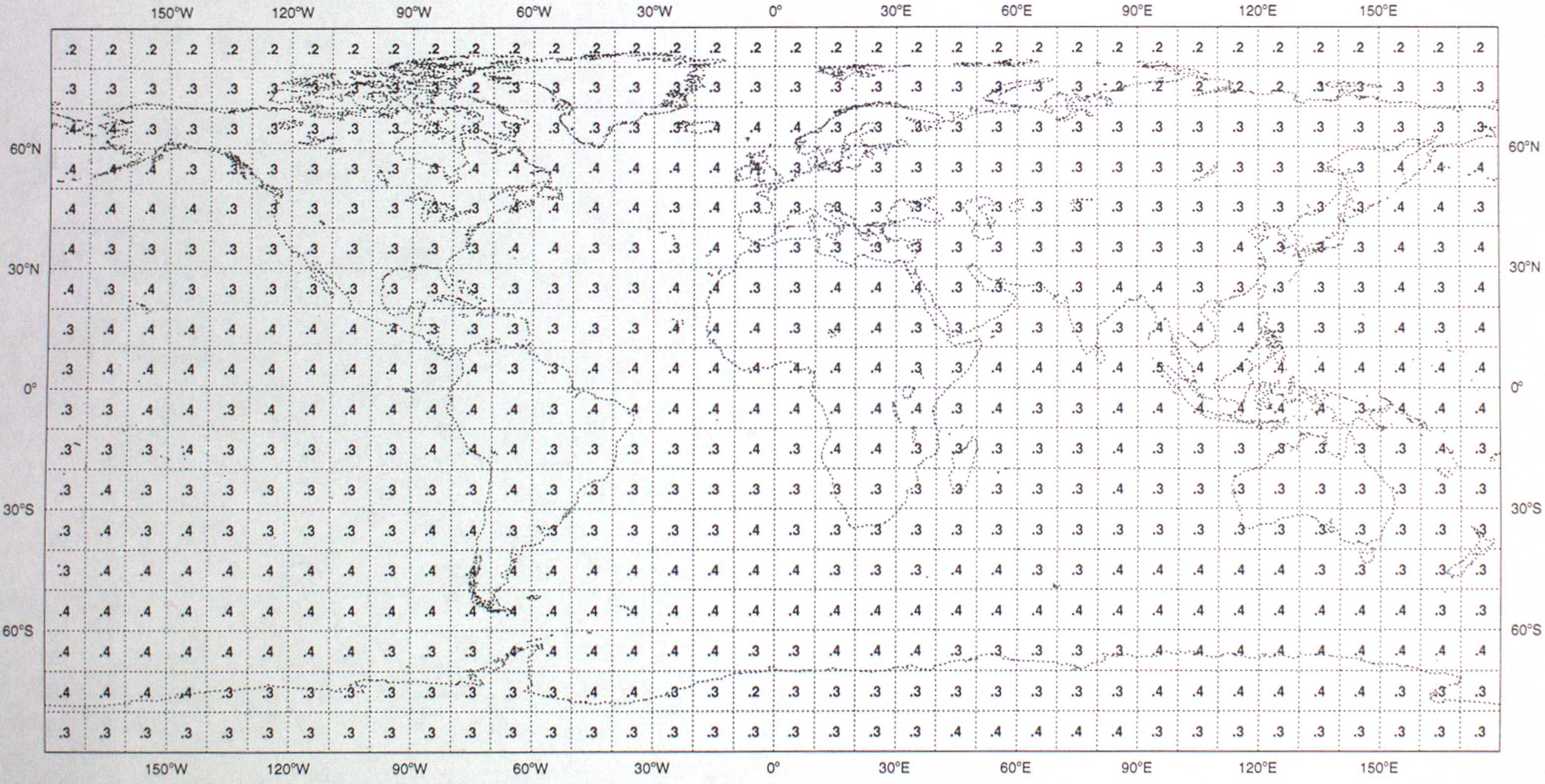
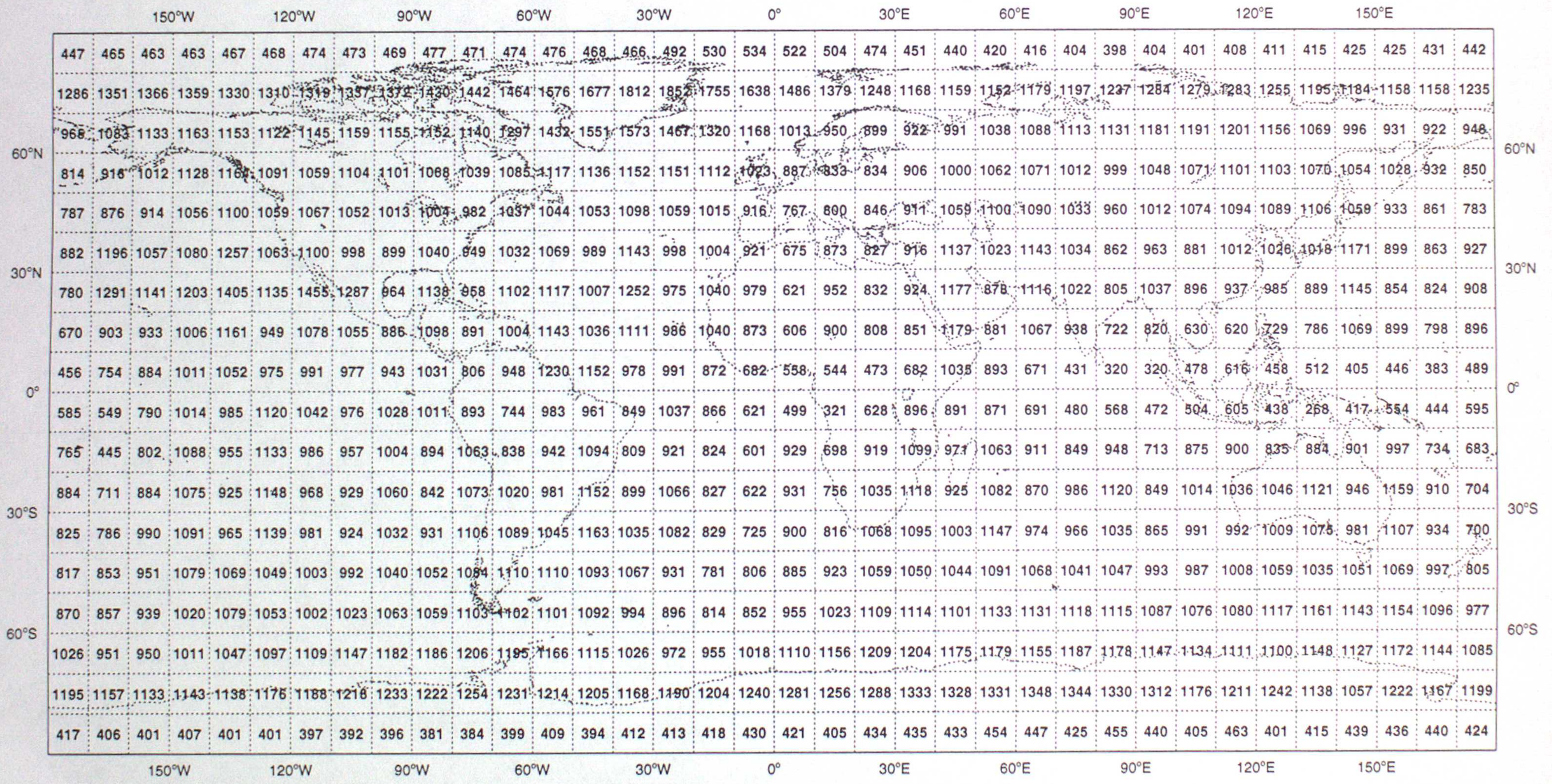
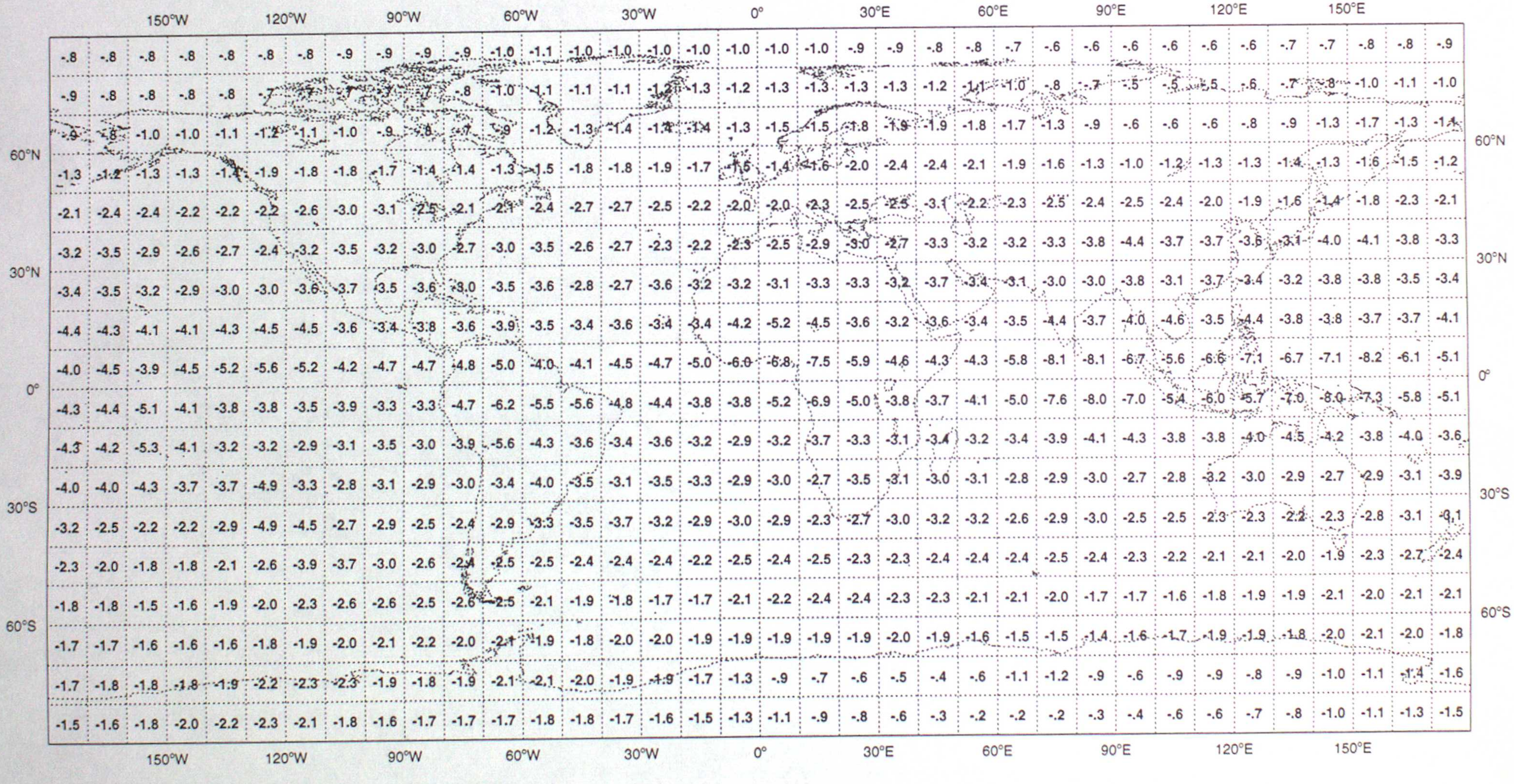

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3
.4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4
.4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .4 .3 .4
.4 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .4 .4 .4 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .4 .3 .4
.3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .4 .3 .4
.3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4
.3 .3 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .3 .3 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4
.3 .3 .3 .4 .3 .3 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .4 .3 .4 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .4 .3
.3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .4 .3 .4 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .4 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3
.4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3

Figure 40. ATOVS mean daily count. APRIL 2001
NOAA16, using all observations
Global average number of observations in 24 hours = 612653



447	465	463	463	467	468	474	473	469	477	471	474	476	468	466	492	530	534	522	504	474	451	440	420	416	404	398	404	401	408	411	415	425	425	431	442
1286	1351	1366	1359	1330	1310	1319	1337	1372	1430	1442	1464	1576	1677	1812	1852	1755	1638	1486	1379	1248	1168	1159	1152	1179	1197	1237	1284	1279	1283	1255	1195	1184	1158	1158	1235
968	1083	1133	1163	1153	1122	1145	1159	1155	1152	1140	1297	1432	1551	1573	1467	1320	1168	1013	950	899	922	991	1038	1088	1113	1131	1181	1191	1201	1156	1069	996	931	922	948
814	916	1012	1128	1164	1091	1059	1104	1101	1068	1039	1085	1117	1136	1152	1151	1112	1023	887	833	834	906	1000	1062	1071	1012	999	1048	1071	1101	1103	1070	1054	1028	932	850
787	876	914	1056	1100	1059	1067	1052	1013	1004	982	1037	1044	1053	1098	1059	1015	916	767	800	846	911	1059	1100	1090	1033	960	1012	1074	1094	1089	1106	1059	933	861	783
882	1196	1057	1080	1257	1063	1100	998	899	1040	949	1032	1069	989	1143	998	1004	921	675	873	827	916	1137	1023	1143	1034	862	963	881	1012	1026	1018	1171	899	863	927
780	1291	1141	1203	1405	1135	1455	1287	964	1138	958	1102	1117	1007	1252	975	1040	979	621	952	832	924	1177	878	1116	1022	805	1037	896	937	985	889	1145	854	824	908
670	903	933	1006	1161	949	1078	1055	886	1098	891	1004	1143	1036	1111	986	1040	873	606	900	808	851	1179	881	1067	938	722	820	630	620	729	786	1069	899	798	896
456	754	884	1011	1052	975	991	977	943	1031	806	948	1230	1152	978	991	872	682	558	544	473	682	1035	893	671	431	320	320	478	616	458	512	405	446	383	489
585	549	790	1014	985	1120	1042	976	1028	1011	893	744	983	961	849	1037	866	621	499	321	628	896	891	871	691	480	568	472	504	605	438	268	417	554	444	595
765	445	802	1088	955	1133	986	957	1004	894	1063	838	942	1094	809	921	824	601	929	698	919	1099	971	1063	911	849	948	713	875	900	835	884	901	997	734	683
884	711	884	1075	925	1148	968	929	1060	842	1073	1020	981	1152	899	1066	827	622	931	756	1035	1118	925	1082	870	986	1120	849	1014	1036	1046	1121	946	1159	910	704
825	786	990	1091	965	1139	981	924	1032	931	1106	1089	1045	1163	1035	1082	829	725	900	816	1068	1095	1003	1147	974	966	1035	865	991	992	1009	1075	981	1107	934	700
817	853	951	1079	1069	1049	1003	992	1040	1052	1084	1110	1110	1093	1067	931	781	806	885	923	1059	1050	1044	1091	1068	1041	1047	993	987	1008	1059	1035	1051	1069	997	805
870	857	939	1020	1079	1053	1002	1023	1063	1059	1103	1102	1101	1092	994	896	814	852	955	1023	1109	1114	1101	1133	1131	1118	1115	1087	1076	1080	1117	1161	1143	1154	1096	977
1026	951	950	1011	1047	1097	1109	1147	1182	1186	1206	1195	1166	1115	1026	972	955	1018	1110	1156	1209	1204	1175	1179	1155	1187	1178	1147	1134	1111	1100	1148	1127	1172	1144	1085
1195	1157	1133	1143	1138	1176	1188	1218	1233	1222	1254	1231	1214	1205	1168	1190	1204	1240	1281	1256	1288	1333	1328	1331	1348	1344	1330	1312	1176	1211	1242	1138	1057	1222	1167	1199
417	406	401	407	401	401	397	392	396	381	384	399	409	394	412	413	418	430	421	405	434	435	433	454	447	425	455	440	405	463	401	415	439	436	440	424

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001
Channel: HIRS8 (Surface)
NOAA16, using all observations



-.8	-.8	-.8	-.8	-.8	-.8	-.8	-.9	-.9	-.9	-.9	-1.0	-1.1	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-.9	-.9	-.8	-.8	-.7	-.6	-.6	-.6	-.6	-.6	-.6	-.7	-.7	-.8	-.8	-.9
-.9	-.8	-.8	-.8	-.8	-.7	-.7	-.7	-.7	-.7	-.8	-1.0	-1.1	-1.1	-1.1	-1.2	-1.3	-1.2	-1.3	-1.3	-1.3	-1.3	-1.2	-1.1	-1.0	-.8	-.7	-.5	-.5	-.5	-.6	-.7	-.8	-1.0	-1.1	-1.0
-.9	-.8	-1.0	-1.0	-1.1	-1.2	-1.1	-1.0	-.9	-.8	-.7	-.9	-1.2	-1.3	-1.4	-1.4	-1.4	-1.3	-1.5	-1.5	-1.8	-1.9	-1.9	-1.8	-1.7	-1.3	-.9	-.6	-.6	-.6	-.8	-.9	-1.3	-1.7	-1.3	-1.4
-1.3	-1.2	-1.3	-1.3	-1.4	-1.9	-1.8	-1.8	-1.7	-1.4	-1.4	-1.3	-1.5	-1.8	-1.8	-1.9	-1.7	-1.5	-1.4	-1.6	-2.0	-2.4	-2.4	-2.1	-1.9	-1.6	-1.3	-1.0	-1.2	-1.3	-1.3	-1.4	-1.3	-1.6	-1.5	-1.2
-2.1	-2.4	-2.4	-2.2	-2.2	-2.2	-2.6	-3.0	-3.1	-2.5	-2.1	-2.1	-2.4	-2.7	-2.7	-2.5	-2.2	-2.0	-2.0	-2.3	-2.5	-2.5	-3.1	-2.2	-2.3	-2.5	-2.4	-2.5	-2.4	-2.0	-1.9	-1.6	-1.4	-1.8	-2.3	-2.1
-3.2	-3.5	-2.9	-2.6	-2.7	-2.4	-3.2	-3.5	-3.2	-3.0	-2.7	-3.0	-3.5	-2.6	-2.7	-2.3	-2.2	-2.3	-2.5	-2.9	-3.0	-2.7	-3.3	-3.2	-3.2	-3.3	-3.8	-4.4	-3.7	-3.7	-3.6	-3.1	-4.0	-4.1	-3.8	-3.3
-3.4	-3.5	-3.2	-2.9	-3.0	-3.0	-3.6	-3.7	-3.5	-3.6	-3.0	-3.5	-3.6	-2.8	-2.7	-3.6	-3.2	-3.2	-3.1	-3.3	-3.3	-3.2	-3.7	-3.4	-3.1	-3.0	-3.0	-3.8	-3.1	-3.7	-3.4	-3.2	-3.8	-3.8	-3.5	-3.4
-4.4	-4.3	-4.1	-4.1	-4.3	-4.5	-4.5	-3.6	-3.4	-3.8	-3.6	-3.9	-3.5	-3.4	-3.6	-3.4	-3.4	-4.2	-5.2	-4.5	-3.6	-3.2	-3.6	-3.4	-3.5	-4.4	-3.7	-4.0	-4.6	-3.5	-4.4	-3.8	-3.8	-3.7	-3.7	-4.1
-4.0	-4.5	-3.9	-4.5	-5.2	-5.6	-5.2	-4.2	-4.7	-4.7	-4.8	-5.0	-4.0	-4.1	-4.5	-4.7	-5.0	-6.0	-6.8	-7.5	-5.9	-4.6	-4.3	-4.3	-5.8	-8.1	-8.1	-6.7	-5.6	-6.6	-7.1	-6.7	-7.1	-8.2	-6.1	-5.1
-4.3	-4.4	-5.1	-4.1	-3.8	-3.8	-3.5	-3.9	-3.3	-3.3	-4.7	-6.2	-5.5	-5.6	-4.8	-4.4	-3.8	-3.8	-5.2	-6.9	-5.0	-3.8	-3.7	-4.1	-5.0	-7.6	-8.0	-7.0	-5.4	-6.0	-5.7	-7.0	-8.0	-7.3	-5.8	-5.1
-4.3	-4.2	-5.3	-4.1	-3.2	-3.2	-2.9	-3.1	-3.5	-3.0	-3.9	-5.6	-4.3	-3.6	-3.4	-3.6	-3.2	-2.9	-3.2	-3.7	-3.3	-3.1	-3.4	-3.2	-3.4	-3.9	-4.1	-4.3	-3.8	-3.8	-4.0	-4.5	-4.2	-3.8	-4.0	-3.6
-4.0	-4.0	-4.3	-3.7	-3.7	-4.9	-3.3	-2.8	-3.1	-2.9	-3.0	-3.4	-4.0	-3.5	-3.1	-3.5	-3.3	-2.9	-3.0	-2.7	-3.5	-3.1	-3.0	-3.1	-2.8	-2.9	-3.0	-2.7	-2.8	-3.2	-3.0	-2.9	-2.7	-2.9	-3.1	-3.9
-3.2	-2.5	-2.2	-2.2	-2.9	-4.9	-4.5	-2.7	-2.9	-2.5	-2.4	-2.9	-3.3	-3.5	-3.7	-3.2	-2.9	-3.0	-2.9	-2.3	-2.7	-3.0	-3.2	-3.2	-2.6	-2.9	-3.0	-2.5	-2.5	-2.3	-2.3	-2.2	-2.3	-2.8	-3.1	-3.1
-2.3	-2.0	-1.8	-1.8	-2.1	-2.6	-3.9	-3.7	-3.0	-2.6	-2.4	-2.5	-2.5	-2.4	-2.4	-2.4	-2.2	-2.5	-2.4	-2.5	-2.3	-2.3	-2.4	-2.4	-2.4	-2.5	-2.4	-2.3	-2.2	-2.1	-2.1	-2.0	-1.9	-2.3	-2.7	-2.4
-1.8	-1.8	-1.5	-1.6	-1.9	-2.0	-2.3	-2.6	-2.6	-2.5	-2.6	-2.5	-2.1	-1.9	-1.8	-1.7	-1.7	-2.1	-2.2	-2.4	-2.4	-2.3	-2.3	-2.1	-2.1	-2.0	-1.7	-1.7	-1.6	-1.8	-1.9	-1.9	-2.1	-2.0	-2.1	-2.1
-1.7	-1.7	-1.6	-1.6	-1.6	-1.8	-1.9	-2.0	-2.1	-2.2	-2.0	-2.1	-1.9	-1.8	-2.0	-2.0	-1.9	-1.9	-1.9	-1.9	-1.9	-2.0	-1.9	-1.6	-1.5	-1.5	-1.4	-1.6	-1.7	-1.9	-1.9	-1.8	-2.0	-2.1	-2.0	-1.8
-1.7	-1.8	-1.8	-1.8	-1.9	-2.2	-2.3	-2.3	-1.9	-1.8	-1.9	-2.1	-2.1	-2.0	-1.9	-1.9	-1.7	-1.3	-.9	-.7	-.6	-.5	-.4	-.6	-1.1	-1.2	-.9	-.6	-.9	-.9	-.8	-.9	-1.0	-1.1	-1.4	-1.6
-1.5	-1.6	-1.8	-2.0	-2.2	-2.3	-2.1	-1.8	-1.6	-1.7	-1.7	-1.7	-1.8	-1.8	-1.7	-1.6	-1.5	-1.3	-1.1	-.9	-.8	-.6	-.3	-.2	-.2	-.2	-.3	-.4	-.6	-.6	-.7	-.8	-1.0	-1.1	-1.3	-1.5

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001
Channel: HIRS8 (Surface)
NOAA16, using all observations

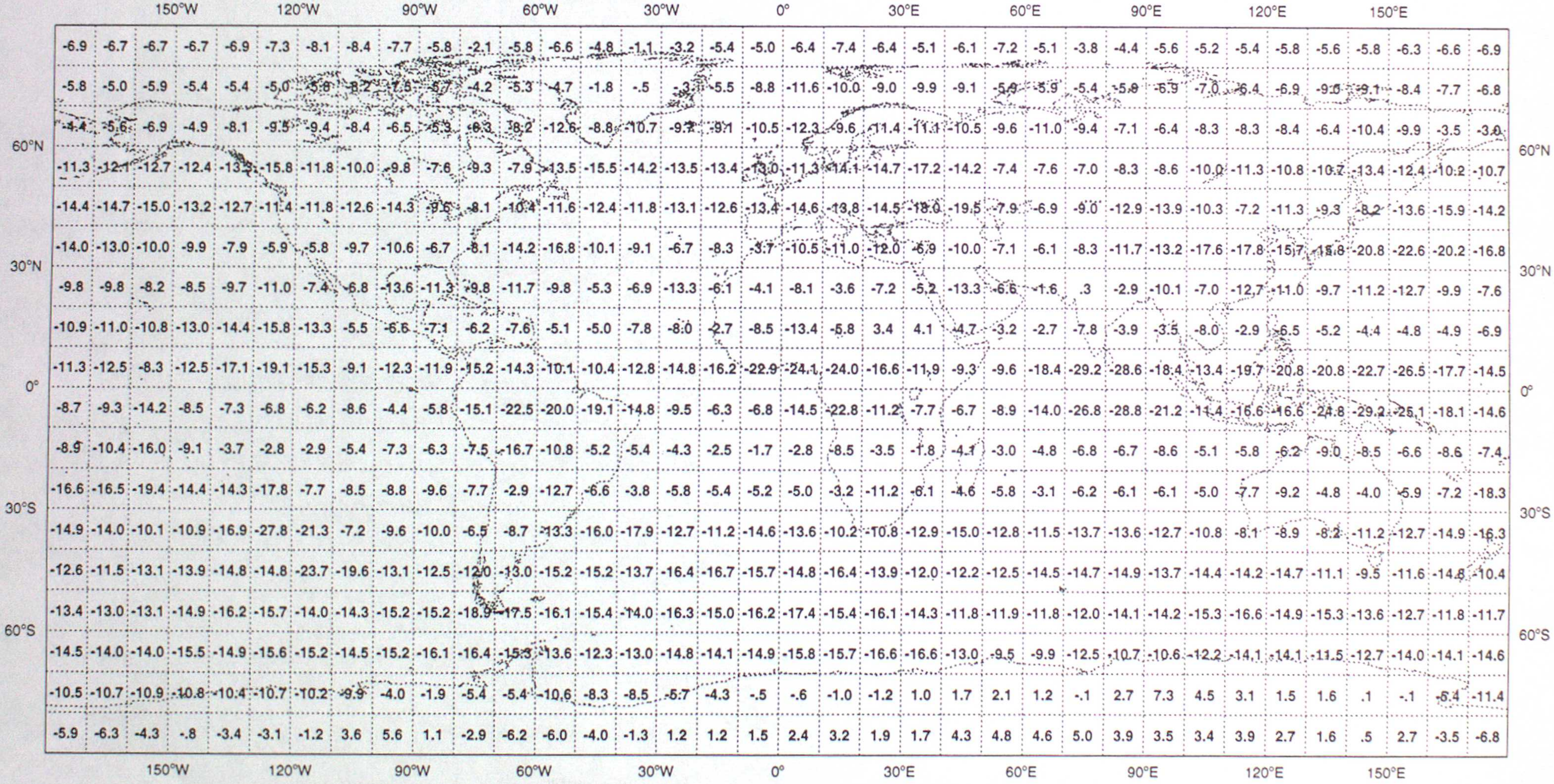
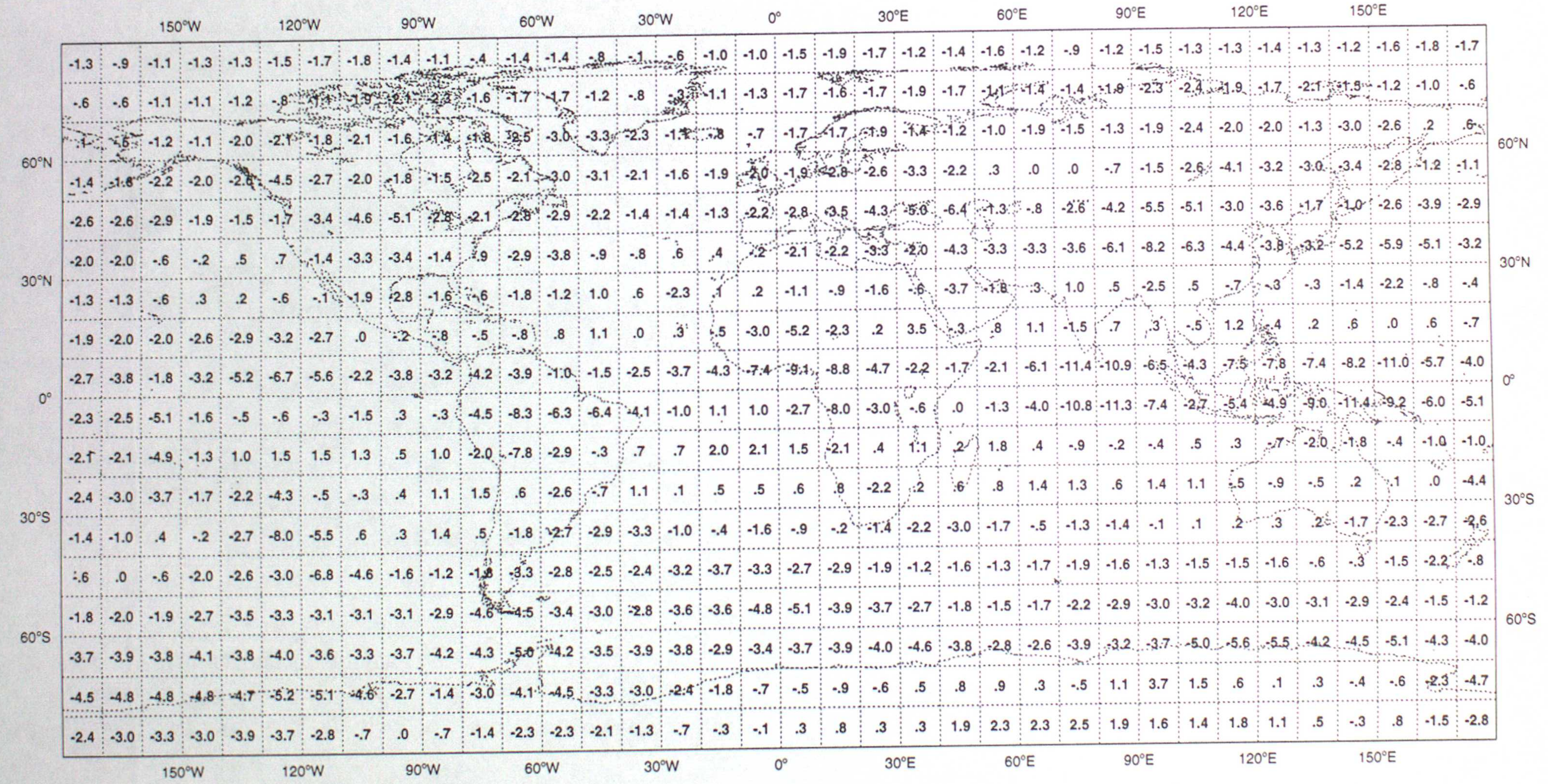

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-6.9 -6.7 -6.7 -6.7 -6.9 -7.3 -8.1 -8.4 -7.7 -5.8 -2.1 -5.8 -6.6 -4.8 -1.1 -3.2 -5.4 -5.0 -6.4 -7.4 -6.4 -5.1 -6.1 -7.2 -5.1 -3.8 -4.4 -5.6 -5.2 -5.4 -5.8 -5.6 -5.8 -6.3 -6.6 -6.9
-5.8 -5.0 -5.9 -5.4 -5.4 -5.0 -5.8 -8.2 -7.5 -5.7 -4.2 -5.3 -4.7 -1.8 -.5 -.3 -5.5 -8.8 -11.6 -10.0 -9.0 -9.9 -9.1 -5.9 -5.9 -5.4 -5.8 -6.9 -7.0 -6.4 -6.9 -9.0 -9.1 -8.4 -7.7 -6.8
-4.4 -5.6 -6.9 -4.9 -8.1 -9.5 -9.4 -8.4 -6.5 -5.3 -6.3 -8.2 -12.6 -8.8 -10.7 -9.7 -9.1 -10.5 -12.3 -9.6 -11.4 -11.1 -10.5 -9.6 -11.0 -9.4 -7.1 -6.4 -8.3 -8.3 -8.4 -6.4 -10.4 -9.9 -3.5 -3.0
-11.3 -12.1 -12.7 -12.4 -13.3 -15.8 -11.8 -10.0 -9.8 -7.6 -9.3 -7.9 -13.5 -15.5 -14.2 -13.5 -13.4 -13.0 -11.3 -14.1 -14.7 -17.2 -14.2 -7.4 -7.6 -7.0 -8.3 -8.6 -10.0 -11.3 -10.8 -10.7 -13.4 -12.4 -10.2 -10.7
-14.4 -14.7 -15.0 -13.2 -12.7 -11.4 -11.8 -12.6 -14.3 -9.6 -8.1 -10.4 -11.6 -12.4 -11.8 -13.1 -12.6 -13.4 -14.6 -13.8 -14.5 -18.0 -19.5 -7.9 -6.9 -9.0 -12.9 -13.9 -10.3 -7.2 -11.3 -9.3 -8.2 -13.6 -15.9 -14.2
-14.0 -13.0 -10.0 -9.9 -7.9 -5.9 -5.8 -9.7 -10.6 -6.7 -8.1 -14.2 -16.8 -10.1 -9.1 -6.7 -8.3 -3.7 -10.5 -11.0 -12.0 -6.9 -10.0 -7.1 -6.1 -8.3 -11.7 -13.2 -17.6 -17.8 -15.7 -15.8 -20.8 -22.6 -20.2 -16.8
-9.8 -9.8 -8.2 -8.5 -9.7 -11.0 -7.4 -6.8 -13.6 -11.3 -9.8 -11.7 -9.8 -5.3 -6.9 -13.3 -6.1 -4.1 -8.1 -3.6 -7.2 -5.2 -13.3 -6.6 -1.6 .3 -2.9 -10.1 -7.0 -12.7 -11.0 -9.7 -11.2 -12.7 -9.9 -7.6
-10.9 -11.0 -10.8 -13.0 -14.4 -15.8 -13.3 -5.5 -6.6 -7.1 -6.2 -7.6 -5.1 -5.0 -7.8 -8.0 -2.7 -8.5 -13.4 -5.8 3.4 4.1 -4.7 -3.2 -2.7 -7.8 -3.9 -3.5 -8.0 -2.9 -6.5 -5.2 -4.4 -4.8 -4.9 -6.9
-11.3 -12.5 -8.3 -12.5 -17.1 -19.1 -15.3 -9.1 -12.3 -11.9 -15.2 -14.3 -10.1 -10.4 -12.8 -14.8 -16.2 -22.9 -24.1 -24.0 -16.6 -11.9 -9.3 -9.6 -18.4 -29.2 -28.6 -18.4 -13.4 -19.7 -20.8 -20.8 -22.7 -26.5 -17.7 -14.5
-8.7 -9.3 -14.2 -8.5 -7.3 -6.8 -6.2 -8.6 -4.4 -5.8 -15.1 -22.5 -20.0 -19.1 -14.8 -9.5 -6.3 -6.8 -14.5 -22.8 -11.2 -7.7 -6.7 -8.9 -14.0 -26.8 -28.8 -21.2 -11.4 -16.6 -16.6 -24.8 -29.2 -25.1 -18.1 -14.6
-8.9 -10.4 -16.0 -9.1 -3.7 -2.8 -2.9 -5.4 -7.3 -6.3 -7.5 -16.7 -10.8 -5.2 -5.4 -4.3 -2.5 -1.7 -2.8 -8.5 -3.5 -1.8 -4.1 -3.0 -4.8 -6.8 -6.7 -8.6 -5.1 -5.8 -6.2 -9.0 -8.5 -6.6 -8.6 -7.4
-16.6 -16.5 -19.4 -14.4 -14.3 -17.8 -7.7 -8.5 -8.8 -9.6 -7.7 -2.9 -12.7 -6.6 -3.8 -5.8 -5.4 -5.2 -5.0 -3.2 -11.2 -6.1 -4.6 -5.8 -3.1 -6.2 -6.1 -6.1 -5.0 -7.7 -9.2 -4.8 -4.0 -5.9 -7.2 -18.3
-14.9 -14.0 -10.1 -10.9 -16.9 -27.8 -21.3 -7.2 -9.6 -10.0 -6.5 -8.7 -13.3 -16.0 -17.9 -12.7 -11.2 -14.6 -13.6 -10.2 -10.8 -12.9 -15.0 -12.8 -11.5 -13.7 -13.6 -12.7 -10.8 -8.1 -8.9 -8.2 -11.2 -12.7 -14.9 -16.3
-12.6 -11.5 -13.1 -13.9 -14.8 -14.8 -23.7 -19.6 -13.1 -12.5 -12.0 -13.0 -15.2 -15.2 -13.7 -16.4 -16.7 -15.7 -14.8 -16.4 -13.9 -12.0 -12.2 -12.5 -14.5 -14.7 -14.9 -13.7 -14.4 -14.2 -14.7 -11.1 -9.5 -11.6 -14.8 -10.4
-13.4 -13.0 -13.1 -14.9 -16.2 -15.7 -14.0 -14.3 -15.2 -15.2 -18.9 -17.5 -16.1 -15.4 -14.0 -16.3 -15.0 -16.2 -17.4 -15.4 -16.1 -14.3 -11.8 -11.9 -11.8 -12.0 -14.1 -14.2 -15.3 -16.6 -14.9 -15.3 -13.6 -12.7 -11.8 -11.7
-14.5 -14.0 -14.0 -15.5 -14.9 -15.6 -15.2 -14.5 -15.2 -16.1 -16.4 -15.3 -13.6 -12.3 -13.0 -14.8 -14.1 -14.9 -15.8 -15.7 -16.6 -16.6 -13.0 -9.5 -9.9 -12.5 -10.7 -10.6 -12.2 -14.1 -14.1 -11.5 -12.7 -14.0 -14.1 -14.6
-10.5 -10.7 -10.9 -10.8 -10.4 -10.7 -10.2 -9.9 -4.0 -1.9 -5.4 -5.4 -10.6 -8.3 -8.5 -5.7 -4.3 -.5 -.6 -1.0 -1.2 1.0 1.7 2.1 1.2 -.1 2.7 7.3 4.5 3.1 1.5 1.6 .1 -.1 -6.4 -11.4
-5.9 -6.3 -4.3 -.8 -3.4 -3.1 -1.2 3.6 5.6 1.1 -2.9 -6.2 -6.0 -4.0 -1.3 1.2 1.2 1.5 2.4 3.2 1.9 1.7 4.3 4.8 4.6 5.0 3.9 3.5 3.4 3.9 2.7 1.6 .5 2.7 -3.5 -6.8
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001

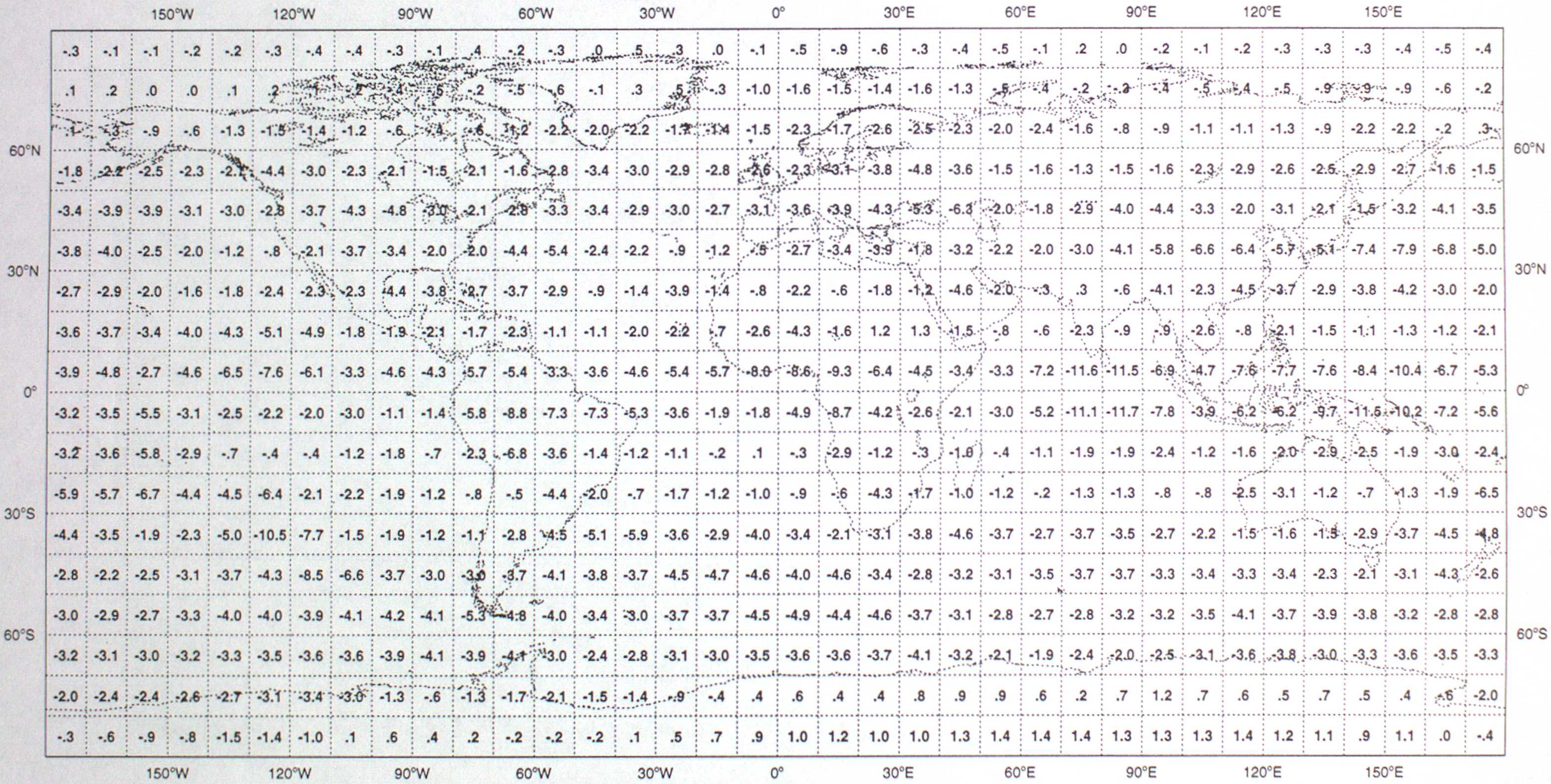
Channel: HIRS15 (700 hPa)

NOAA16, using all observations



-1.3	-.9	-1.1	-1.3	-1.3	-1.5	-1.7	-1.8	-1.4	-1.1	-.4	-1.4	-1.4	-.8	-.1	-.6	-1.0	-1.0	-1.5	-1.9	-1.7	-1.2	-1.4	-1.6	-1.2	-.9	-1.2	-1.5	-1.3	-1.3	-1.4	-1.3	-1.2	-1.6	-1.8	-1.7
-.6	-.6	-1.1	-1.1	-1.2	-.8	-1.1	-1.9	-2.1	-2.3	-1.6	-1.7	-1.7	-1.2	-.8	-.3	-1.1	-1.3	-1.7	-1.6	-1.7	-1.9	-1.7	-1.1	-1.4	-1.4	-1.8	-2.3	-2.4	-1.9	-1.7	-2.1	-1.5	-1.2	-1.0	-.6
-.1	-.5	-1.2	-1.1	-2.0	-2.1	-1.8	-2.1	-1.6	-1.4	-1.8	-2.5	-3.0	-3.3	-2.3	-1.1	-.8	-.7	-1.7	-1.7	-1.9	-1.4	-1.2	-1.0	-1.9	-1.5	-1.3	-1.9	-2.4	-2.0	-2.0	-1.3	-3.0	-2.6	.2	.6
-1.4	-1.6	-2.2	-2.0	-2.6	-4.5	-2.7	-2.0	-1.8	-1.5	-2.5	-2.1	-3.0	-3.1	-2.1	-1.6	-1.9	-2.0	-1.9	-2.8	-2.6	-3.3	-2.2	.3	.0	.0	-.7	-1.5	-2.6	-4.1	-3.2	-3.0	-3.4	-2.8	-1.2	-1.1
-2.6	-2.6	-2.9	-1.9	-1.5	-1.7	-3.4	-4.6	-5.1	-2.8	-2.1	-2.8	-2.9	-2.2	-1.4	-1.4	-1.3	-2.2	-2.8	-3.5	-4.3	-5.0	-6.4	-1.3	-.8	-2.6	-4.2	-5.5	-5.1	-3.0	-3.6	-1.7	-1.0	-2.6	-3.9	-2.9
-2.0	-2.0	-.6	-.2	.5	.7	-1.4	-3.3	-3.4	-1.4	.9	-2.9	-3.8	-.9	-.8	.6	.4	.2	-2.1	-2.2	-3.3	-2.0	-4.3	-3.3	-3.3	-3.6	-6.1	-8.2	-6.3	-4.4	-3.8	-3.2	-5.2	-5.9	-5.1	-3.2
-1.3	-1.3	-.6	.3	.2	-.6	-.1	-1.9	2.8	-1.6	-.6	-1.8	-1.2	1.0	.6	-2.3	.1	.2	-1.1	-.9	-1.6	-.6	-3.7	-1.8	.3	1.0	.5	-2.5	.5	-.7	-.3	-.3	-1.4	-2.2	-.8	-.4
-1.9	-2.0	-2.0	-2.6	-2.9	-3.2	-2.7	.0	-.2	-.8	-.5	-.8	.8	1.1	.0	.3	.5	-3.0	-5.2	-2.3	.2	3.5	-.3	.8	1.1	-1.5	.7	.3	-.5	1.2	-.4	.2	.6	.0	.6	-.7
-2.7	-3.8	-1.8	-3.2	-5.2	-6.7	-5.6	-2.2	-3.8	-3.2	-4.2	-3.9	-1.0	-1.5	-2.5	-3.7	-4.3	-7.4	-9.1	-8.8	-4.7	-2.2	-1.7	-2.1	-6.1	-11.4	-10.9	-6.5	-4.3	-7.5	-7.8	-7.4	-8.2	-11.0	-5.7	-4.0
-2.3	-2.5	-5.1	-1.6	-.5	-.6	-.3	-1.5	.3	-.3	-4.5	-8.3	-6.3	-6.4	-4.1	-1.0	1.1	1.0	-2.7	-8.0	-3.0	-.6	.0	-1.3	-4.0	-10.8	-11.3	-7.4	-2.7	-5.4	-4.9	-9.0	-11.4	-9.2	-6.0	-5.1
-2.1	-2.1	-4.9	-1.3	1.0	1.5	1.5	1.3	.5	1.0	-2.0	-7.8	-2.9	-.3	.7	.7	2.0	2.1	1.5	-2.1	.4	1.1	.2	1.8	.4	-.9	-.2	-.4	.5	.3	-.7	-2.0	-1.8	-.4	-1.0	-1.0
-2.4	-3.0	-3.7	-1.7	-2.2	-4.3	-.5	-.3	.4	1.1	1.5	.6	-2.6	-.7	1.1	.1	.5	.5	.6	.8	-2.2	.2	.6	.8	1.4	1.3	.6	1.4	1.1	-.5	-.9	-.5	.2	.1	.0	-4.4
-1.4	-1.0	.4	-.2	-2.7	-8.0	-5.5	.6	.3	1.4	.5	-1.8	-2.7	-2.9	-3.3	-1.0	-.4	-1.6	-.9	-.2	-1.4	-2.2	-3.0	-1.7	-.5	-1.3	-1.4	-.1	.1	.2	.3	.2	-1.7	-2.3	-2.7	-2.6
-.6	.0	-.6	-2.0	-2.6	-3.0	-6.8	-4.6	-1.6	-1.2	-1.8	-3.3	-2.8	-2.5	-2.4	-3.2	-3.7	-3.3	-2.7	-2.9	-1.9	-1.2	-1.6	-1.3	-1.7	-1.9	-1.6	-1.3	-1.5	-1.5	-1.6	-.6	-.3	-1.5	-2.2	-.8
-1.8	-2.0	-1.9	-2.7	-3.5	-3.3	-3.1	-3.1	-3.1	-2.9	-4.6	-4.5	-3.4	-3.0	-2.8	-3.6	-3.6	-4.8	-5.1	-3.9	-3.7	-2.7	-1.8	-1.5	-1.7	-2.2	-2.9	-3.0	-3.2	-4.0	-3.0	-3.1	-2.9	-2.4	-1.5	-1.2
-3.7	-3.9	-3.8	-4.1	-3.8	-4.0	-3.6	-3.3	-3.7	-4.2	-4.3	-5.0	-4.2	-3.5	-3.9	-3.8	-2.9	-3.4	-3.7	-3.9	-4.0	-4.6	-3.8	-2.8	-2.6	-3.9	-3.2	-3.7	-5.0	-5.6	-5.5	-4.2	-4.5	-5.1	-4.3	-4.0
-4.5	-4.8	-4.8	-4.8	-4.7	-5.2	-5.1	-4.6	-2.7	-1.4	-3.0	-4.1	-4.5	-3.3	-3.0	-2.4	-1.8	-.7	-.5	-.9	-.6	.5	.8	.9	.3	-.5	1.1	3.7	1.5	.6	.1	.3	-.4	-.6	-2.3	-4.7
-2.4	-3.0	-3.3	-3.0	-3.9	-3.7	-2.8	-.7	.0	-.7	-1.4	-2.3	-2.3	-2.1	-1.3	-.7	-.3	-.1	.3	.8	.3	.3	1.9	2.3	2.3	2.5	1.9	1.6	1.4	1.8	1.1	.5	-.3	.8	-1.5	-2.8

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

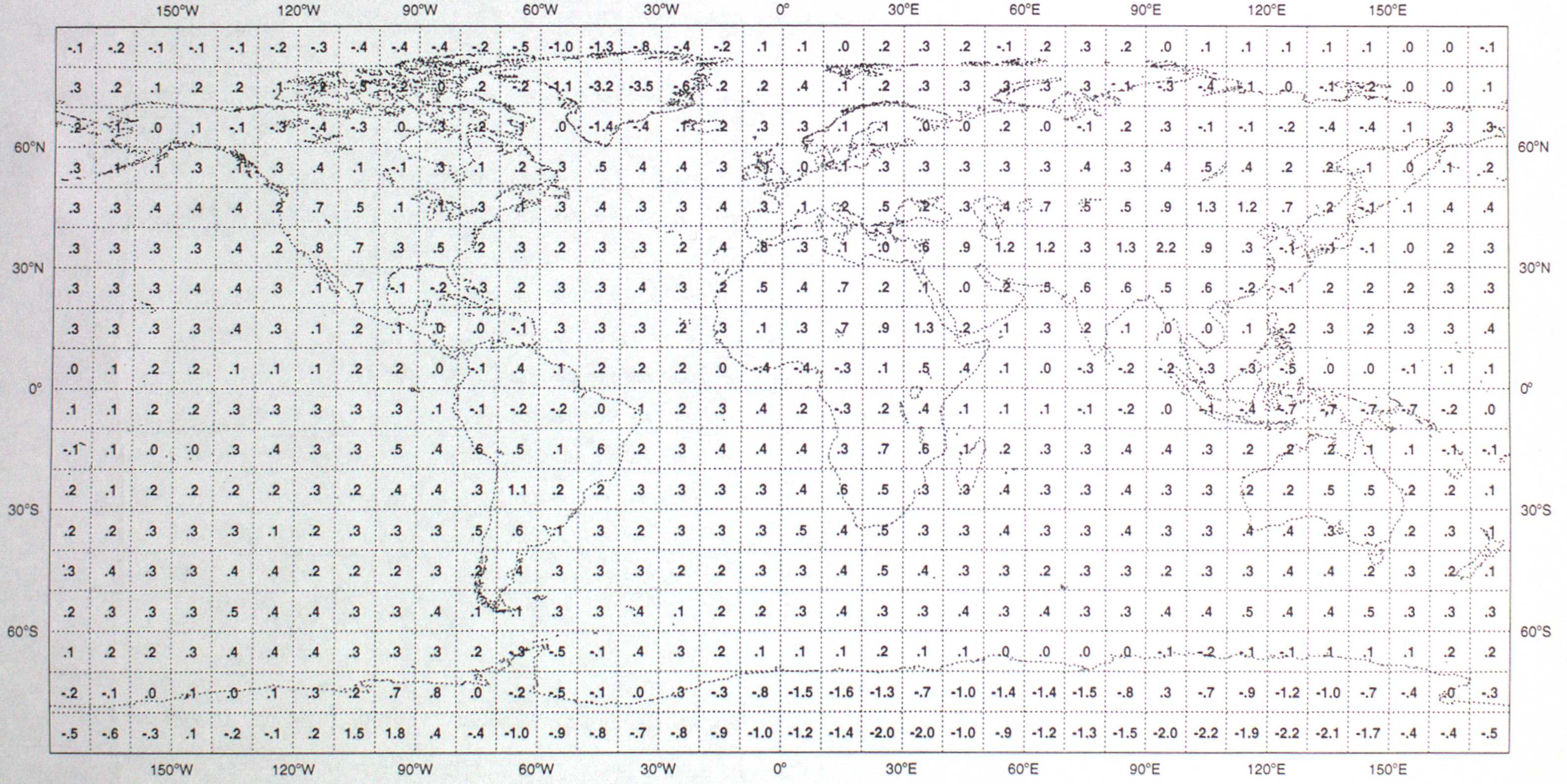


-.3	-.1	-.1	-.2	-.2	-.3	-.4	-.4	-.3	-.1	.4	-.2	-.3	.0	.5	.3	.0	-.1	-.5	-.9	-.6	-.3	-.4	-.5	-.1	.2	.0	-.2	-.1	-.2	-.3	-.3	-.3	-.4	-.5	-.4
.1	.2	.0	.0	.1	.2	-.1	-.2	-.4	-.5	-.2	-.5	-.6	-.1	.3	.5	-.3	-1.0	-1.6	-1.5	-1.4	-1.6	-1.3	-.5	-.4	-.2	-.3	-.4	-.5	-.4	-.5	-.9	-.9	-.9	-.6	-.2
.1	-.3	-.9	-.6	-1.3	-1.5	-1.4	-1.2	-.6	-.4	-.6	-1.2	-2.2	-2.0	-2.2	-1.7	-1.4	-1.5	-2.3	-1.7	-2.6	-2.5	-2.3	-2.0	-2.4	-1.6	-.8	-.9	-1.1	-1.1	-1.3	-.9	-2.2	-2.2	-.2	.3
-1.8	-2.2	-2.5	-2.3	-2.1	-4.4	-3.0	-2.3	-2.1	-1.5	-2.1	-1.6	-2.8	-3.4	-3.0	-2.9	-2.8	-2.6	-2.3	-3.1	-3.8	-4.8	-3.6	-1.5	-1.6	-1.3	-1.5	-1.6	-2.3	-2.9	-2.6	-2.5	-2.9	-2.7	-1.6	-1.5
-3.4	-3.9	-3.9	-3.1	-3.0	-2.8	-3.7	-4.3	-4.8	-3.0	-2.1	-2.8	-3.3	-3.4	-2.9	-3.0	-2.7	-3.1	-3.6	-3.9	-4.3	-5.3	-6.3	-2.0	-1.8	-2.9	-4.0	-4.4	-3.3	-2.0	-3.1	-2.1	-1.5	-3.2	-4.1	-3.5
-3.8	-4.0	-2.5	-2.0	-1.2	-.8	-2.1	-3.7	-3.4	-2.0	-2.0	-4.4	-5.4	-2.4	-2.2	-.9	-1.2	-.5	-2.7	-3.4	-3.9	-1.8	-3.2	-2.2	-2.0	-3.0	-4.1	-5.8	-6.6	-6.4	-5.7	-5.1	-7.4	-7.9	-6.8	-5.0
-2.7	-2.9	-2.0	-1.6	-1.8	-2.4	-2.3	-2.3	-4.4	-3.8	-2.7	-3.7	-2.9	-.9	-1.4	-3.9	-1.4	-.8	-2.2	-.6	-1.8	-1.2	-4.6	-2.0	-.3	.3	-.6	-4.1	-2.3	-4.5	-3.7	-2.9	-3.8	-4.2	-3.0	-2.0
-3.6	-3.7	-3.4	-4.0	-4.3	-5.1	-4.9	-1.8	-1.9	-2.1	-1.7	-2.3	-1.1	-1.1	-2.0	-2.2	-.7	-2.6	-4.3	-1.6	1.2	1.3	-1.5	-.8	-.6	-2.3	-.9	-.9	-2.6	-.8	-2.1	-1.5	-1.1	-1.3	-1.2	-2.1
-3.9	-4.8	-2.7	-4.6	-6.5	-7.6	-6.1	-3.3	-4.6	-4.3	-5.7	-5.4	-3.3	-3.6	-4.6	-5.4	-5.7	-8.0	-8.6	-9.3	-6.4	-4.5	-3.4	-3.3	-7.2	-11.6	-11.5	-6.9	-4.7	-7.6	-7.7	-7.6	-8.4	-10.4	-6.7	-5.3
-3.2	-3.5	-5.5	-3.1	-2.5	-2.2	-2.0	-3.0	-1.1	-1.4	-5.8	-8.8	-7.3	-7.3	-5.3	-3.6	-1.9	-1.8	-4.9	-8.7	-4.2	-2.6	-2.1	-3.0	-5.2	-11.1	-11.7	-7.8	-3.9	-6.2	-6.2	-9.7	-11.5	-10.2	-7.2	-5.6
-3.2	-3.6	-5.8	-2.9	-.7	-.4	-.4	-1.2	-1.8	-.7	-2.3	-6.8	-3.6	-1.4	-1.2	-1.1	-.2	.1	-.3	-2.9	-1.2	-.3	-1.0	-.4	-1.1	-1.9	-1.9	-2.4	-1.2	-1.6	-2.0	-2.9	-2.5	-1.9	-3.0	-2.4
-5.9	-5.7	-6.7	-4.4	-4.5	-6.4	-2.1	-2.2	-1.9	-1.2	-.8	-.5	-4.4	-2.0	-.7	-1.7	-1.2	-1.0	-.9	-.6	-4.3	-1.7	-1.0	-1.2	-.2	-1.3	-1.3	-.8	-.8	-2.5	-3.1	-1.2	-.7	-1.3	-1.9	-6.5
-4.4	-3.5	-1.9	-2.3	-5.0	-10.5	-7.7	-1.5	-1.9	-1.2	-1.1	-2.8	-4.5	-5.1	-5.9	-3.6	-2.9	-4.0	-3.4	-2.1	-3.1	-3.8	-4.6	-3.7	-2.7	-3.7	-3.5	-2.7	-2.2	-1.5	-1.6	-1.5	-2.9	-3.7	-4.5	-4.8
-2.8	-2.2	-2.5	-3.1	-3.7	-4.3	-8.5	-6.6	-3.7	-3.0	-3.0	-3.7	-4.1	-3.8	-3.7	-4.5	-4.7	-4.6	-4.0	-4.6	-3.4	-2.8	-3.2	-3.1	-3.5	-3.7	-3.7	-3.3	-3.4	-3.3	-3.4	-2.3	-2.1	-3.1	-4.3	-2.6
-3.0	-2.9	-2.7	-3.3	-4.0	-4.0	-3.9	-4.1	-4.2	-4.1	-5.3	-4.8	-4.0	-3.4	-3.0	-3.7	-3.7	-4.5	-4.9	-4.4	-4.6	-3.7	-3.1	-2.8	-2.7	-2.8	-3.2	-3.2	-3.5	-4.1	-3.7	-3.9	-3.8	-3.2	-2.8	-2.8
-3.2	-3.1	-3.0	-3.2	-3.3	-3.5	-3.6	-3.6	-3.9	-4.1	-3.9	-4.1	-3.0	-2.4	-2.8	-3.1	-3.0	-3.5	-3.6	-3.6	-3.7	-4.1	-3.2	-2.1	-1.9	-2.4	-2.0	-2.5	-3.1	-3.6	-3.8	-3.0	-3.3	-3.6	-3.5	-3.3
-2.0	-2.4	-2.4	-2.6	-2.7	-3.1	-3.4	-3.0	-1.3	-.6	-1.3	-1.7	-2.1	-1.5	-1.4	-.9	-.4	.4	.6	.4	.4	.8	.9	.9	.6	.2	.7	1.2	.7	.6	.5	.7	.5	.4	-.6	-2.0
-.3	-.6	-.9	-.8	-1.5	-1.4	-1.0	.1	.6	.4	.2	-.2	-.2	-.2	.1	.5	.7	.9	1.0	1.2	1.0	1.0	1.3	1.4	1.4	1.4	1.3	1.3	1.3	1.4	1.2	1.1	.9	1.1	.0	-.4

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001

Channel: HIRS11 (500 - 700 hPa)

NOAA16, using all observations



-.1	-.2	-.1	-.1	-.1	-.2	-.3	-.4	-.4	-.4	-.2	-.5	-1.0	-1.3	-.8	-.4	-.2	.1	.1	.0	.2	.3	.2	-.1	.2	.3	.2	.0	.1	.1	.1	.1	.1	.0	.0	-.1
.3	.2	.1	.2	.2	.1	.2	.5	.2	.0	.2	-.2	-1.1	-3.2	-3.5	-.6	.2	.2	.4	.1	.2	.3	.3	.3	.3	.3	-.1	-.3	-.4	.1	.0	-.1	-.2	.0	.0	.1
.2	.1	.0	.1	-.1	-.3	-.4	-.3	.0	.3	.2	.1	.0	-1.4	-.4	.1	.2	.3	.3	.1	.1	.0	.0	.2	.0	-.1	.2	.3	-.1	-.1	-.2	-.4	-.4	.1	.3	.3
.3	.1	.1	.3	.1	.3	.4	.1	-.1	.3	.1	.2	.3	.5	.4	.4	.3	.1	.0	.1	.3	.3	.3	.3	.3	.4	.3	.4	.5	.4	.2	.2	.1	.0	.1	.2
.3	.3	.4	.4	.4	.2	.7	.5	.1	.1	.3	.1	.3	.4	.3	.3	.4	.3	.1	.2	.5	.2	.3	.4	.7	.5	.5	.9	1.3	1.2	.7	.2	-.1	.1	.4	.4
.3	.3	.3	.3	.4	.2	.8	.7	.3	.5	.2	.3	.2	.3	.3	.2	.4	.8	.3	.1	.0	.6	.9	1.2	1.2	.3	1.3	2.2	.9	.3	-.1	-.1	-.1	.0	.2	.3
.3	.3	.3	.4	.4	.3	.1	.7	-.1	-.2	-.3	.2	.3	.3	.4	.3	.2	.5	.4	.7	.2	.1	.0	.2	.5	.6	.6	.5	.6	-.2	-.1	.2	.2	.2	.3	.3
.3	.3	.3	.3	.4	.3	.1	.2	.1	.0	.0	-.1	.3	.3	.3	.2	.3	.1	.3	.7	.9	1.3	.2	.1	.3	.2	.1	.0	.0	.1	-.2	.3	.2	.3	.3	.4
.0	.1	.2	.2	.1	.1	.1	.2	.2	.0	-.1	.4	.1	.2	.2	.2	.0	-.4	-.4	-.3	.1	.5	.4	.1	.0	-.3	-.2	-.2	-.3	-.3	-.5	.0	.0	-.1	.1	.1
.1	.1	.2	.2	.3	.3	.3	.3	.3	.1	-.1	-.2	-.2	.0	.1	.2	.3	.4	.2	-.3	.2	.4	.1	.1	.1	-.1	-.2	.0	-.1	-.4	-.7	-.7	-.7	-.7	-.2	.0
-.1	.1	.0	.0	.3	.4	.3	.3	.5	.4	.6	.5	.1	.6	.2	.3	.4	.4	.4	.3	.7	.6	.1	.2	.3	.3	.4	.4	.3	.2	.2	.2	.1	.1	-.1	-.1
.2	.1	.2	.2	.2	.2	.3	.2	.4	.4	.3	1.1	.2	.2	.3	.3	.3	.3	.4	.6	.5	.3	.3	.4	.3	.3	.4	.3	.3	.2	.2	.5	.5	.2	.2	.1
.2	.2	.3	.3	.3	.1	.2	.3	.3	.3	.5	.6	.1	.3	.2	.3	.3	.3	.5	.4	.5	.3	.3	.4	.3	.3	.4	.3	.3	.4	.4	.3	.3	.2	.3	.1
.3	.4	.3	.3	.4	.4	.2	.2	.2	.3	.2	.4	.3	.3	.3	.2	.2	.3	.3	.4	.5	.4	.3	.3	.2	.3	.3	.2	.3	.3	.4	.4	.2	.3	.2	.1
.2	.3	.3	.3	.5	.4	.4	.3	.3	.4	.1	.1	.3	.3	.4	.1	.2	.2	.3	.4	.3	.3	.4	.3	.4	.3	.3	.4	.4	.5	.4	.4	.5	.3	.3	.3
.1	.2	.2	.3	.4	.4	.4	.3	.3	.3	.2	.3	-.5	-.1	.4	.3	.2	.1	.1	.1	.2	.1	.1	.0	.0	.0	.0	-.1	-.2	-.1	-.1	.1	.1	.1	.2	.2
-.2	-.1	.0	.1	.0	.1	.3	.2	.7	.8	.0	-.2	-.5	-.1	.0	.3	-.3	-.8	-1.5	-1.6	-1.3	-.7	-1.0	-1.4	-1.4	-1.5	-.8	.3	-.7	-.9	-1.2	-1.0	-.7	-.4	.0	-.3
-.5	-.6	-.3	.1	-.2	-.1	.2	1.5	1.8	.4	-.4	-1.0	-.9	-.8	-.7	-.8	-.9	-1.0	-1.2	-1.4	-2.0	-2.0	-1.0	-.9	-1.2	-1.3	-1.5	-2.0	-2.2	-1.9	-2.2	-2.1	-1.7	-.4	-.4	-.5

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

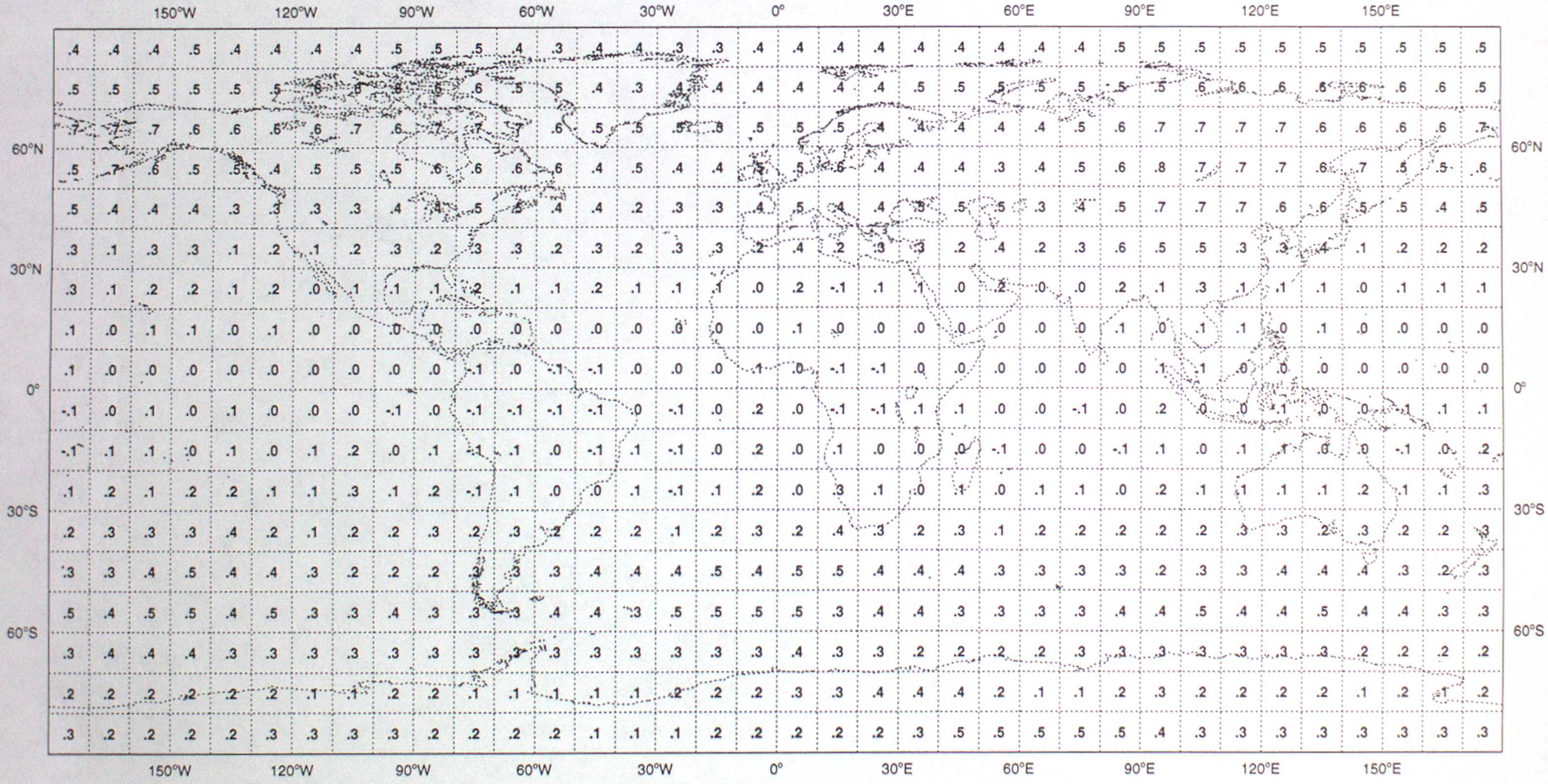

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001

Channel: HIRS4 (400 hPa)

NOAA16, using all observations

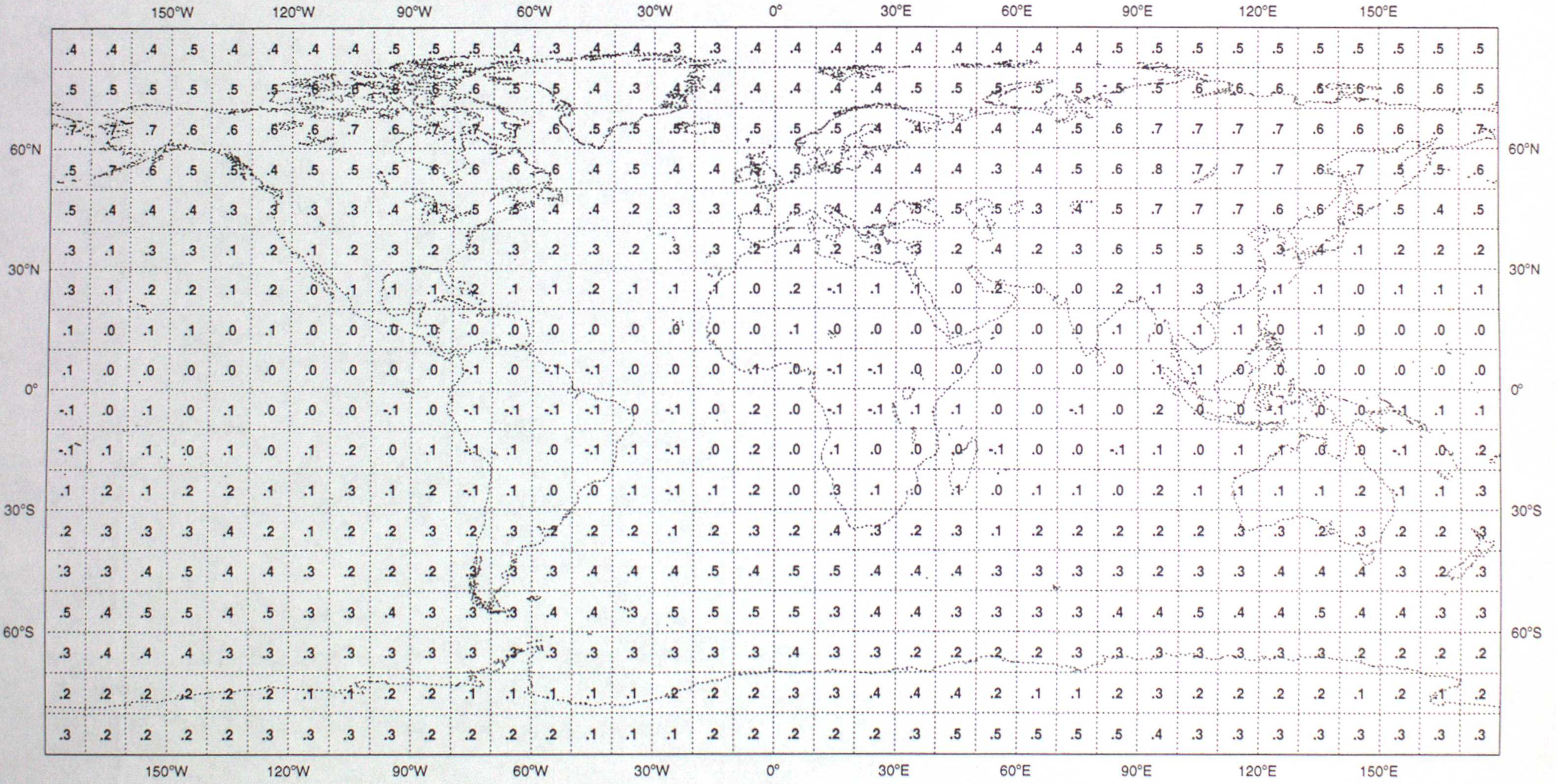

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .4 .5 .4 .4 .4 .4 .5 .5 .5 .4 .3 .4 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5
.5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .5 .5 .4 .3 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .6 .5
.7 .7 .7 .6 .6 .6 .6 .7 .6 .7 .7 .7 .6 .5 .5 .5 .8 .5 .5 .5 .4 .4 .4 .4 .4 .5 .6 .7 .7 .7 .7 .6 .6 .6 .6 .7
.5 .7 .6 .5 .5 .4 .5 .5 .5 .6 .6 .6 .6 .4 .5 .4 .4 .5 .5 .6 .4 .4 .4 .3 .4 .5 .6 .8 .7 .7 .7 .6 .7 .5 .5 .6
.5 .4 .4 .4 .3 .3 .3 .3 .4 .4 .5 .5 .4 .4 .2 .3 .3 .4 .5 .4 .4 .5 .5 .5 .3 .4 .5 .7 .7 .7 .6 .6 .5 .5 .4 .5
.3 .1 .3 .3 .1 .2 .1 .2 .3 .2 .3 .3 .2 .3 .2 .3 .3 .2 .4 .2 .3 .3 .2 .4 .2 .3 .6 .5 .5 .3 .3 .4 .1 .2 .2 .2
.3 .1 .2 .2 .1 .2 .0 .1 .1 .1 .2 .1 .1 .2 .1 .1 .1 .0 .2 -.1 .1 .1 .0 .2 .0 .0 .2 .1 .3 .1 .1 .1 .0 .1 .1 .1
.1 .0 .1 .1 .0 .1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .1 .0 .0 .0 .0 .0 .0 .0 .1 .0 .1 .1 .0 .1 .0 .0 .0 .0
.1 .0 .0 .0 .0 .0 .0 .0 .0 .0 -.1 .0 -.1 -.1 .0 .0 .0 .1 .0 -.1 -.1 .0 .0 .0 .0 .0 .0 .1 .1 .0 .0 .0 .0 .0 .0 .0
-.1 .0 .1 .0 .1 .0 .0 .0 -.1 .0 -.1 -.1 -.1 -.1 .0 -.1 .0 .2 .0 -.1 -.1 .1 .1 .0 .0 -.1 .0 .2 .0 .0 .1 .0 .0 -.1 .1 .1
-.1 .1 .1 .0 .1 .0 .1 .2 .0 .1 -.1 .1 .0 -.1 .1 -.1 .0 .2 .0 .1 .0 .0 .0 -.1 .0 .0 -.1 .1 .0 .1 .1 .0 .0 -.1 .0 .2
.1 .2 .1 .2 .2 .1 .1 .3 .1 .2 -.1 .1 .0 .0 .1 -.1 .1 .2 .0 .3 .1 .0 .1 .0 .1 .1 .0 .2 .1 .1 .1 .1 .2 .1 .1 .3
.2 .3 .3 .3 .4 .2 .1 .2 .2 .3 .2 .3 .2 .2 .2 .1 .2 .3 .2 .4 .3 .2 .3 .1 .2 .2 .2 .2 .2 .3 .3 .2 .3 .2 .2 .3
.3 .3 .4 .5 .4 .4 .3 .2 .2 .2 .3 .3 .3 .4 .4 .4 .5 .4 .5 .5 .4 .4 .4 .3 .3 .3 .3 .2 .3 .3 .4 .4 .4 .3 .2 .3
.5 .4 .5 .5 .4 .5 .3 .3 .4 .3 .3 .3 .4 .4 .3 .5 .5 .5 .5 .3 .4 .4 .3 .3 .3 .3 .4 .4 .5 .4 .4 .5 .4 .4 .3 .3
.3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2
.2 .2 .2 .2 .2 .2 .1 .1 .2 .2 .1 .1 .1 .1 .1 .2 .2 .2 .3 .3 .4 .4 .4 .2 .1 .1 .2 .3 .2 .2 .2 .2 .1 .2 .1 .2
.3 .2 .2 .2 .2 .3 .3 .3 .3 .2 .2 .2 .2 .1 .1 .1 .2 .2 .2 .2 .2 .3 .5 .5 .5 .5 .5 .4 .3 .3 .3 .3 .3 .3 .3 .3

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

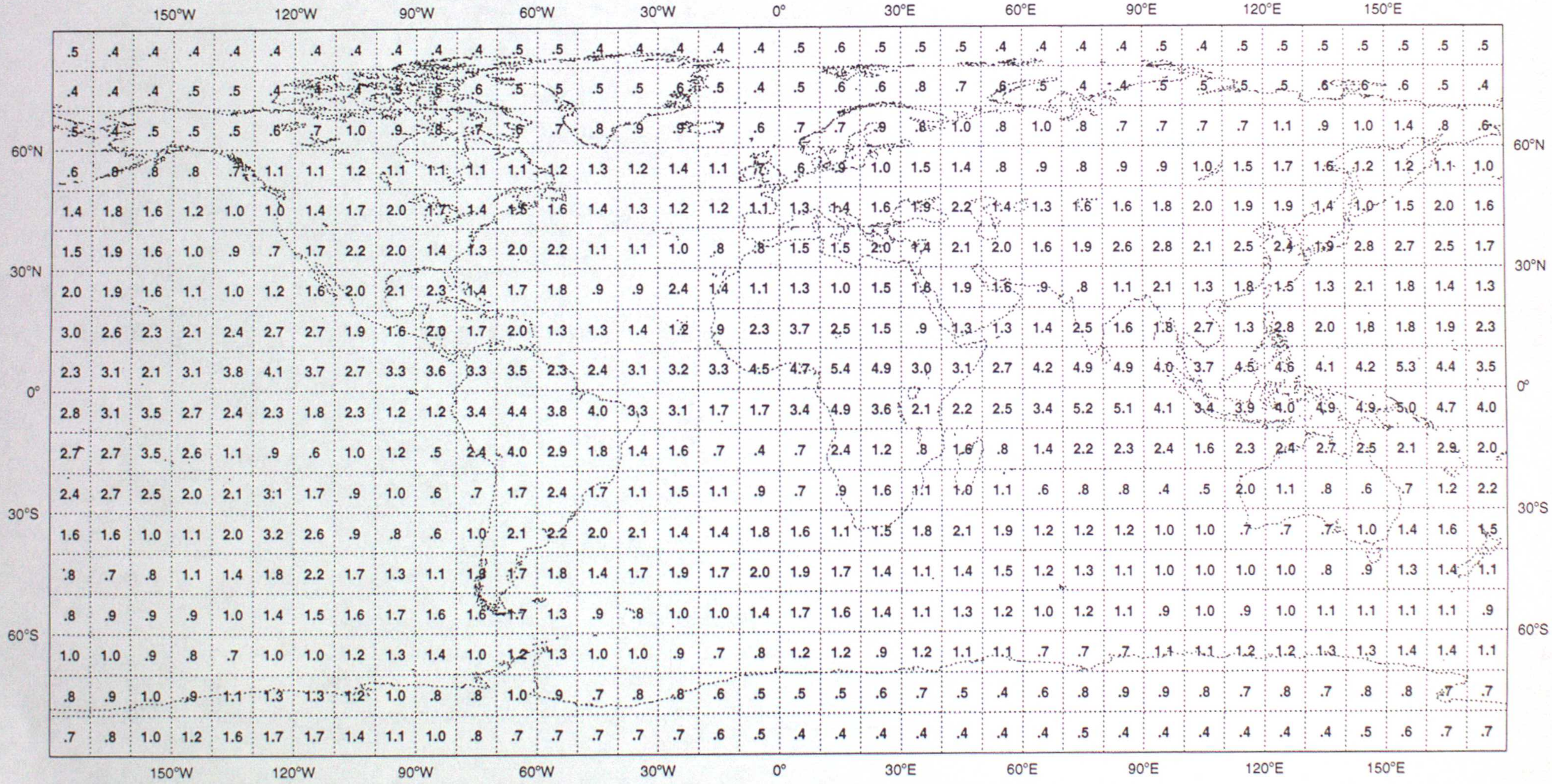
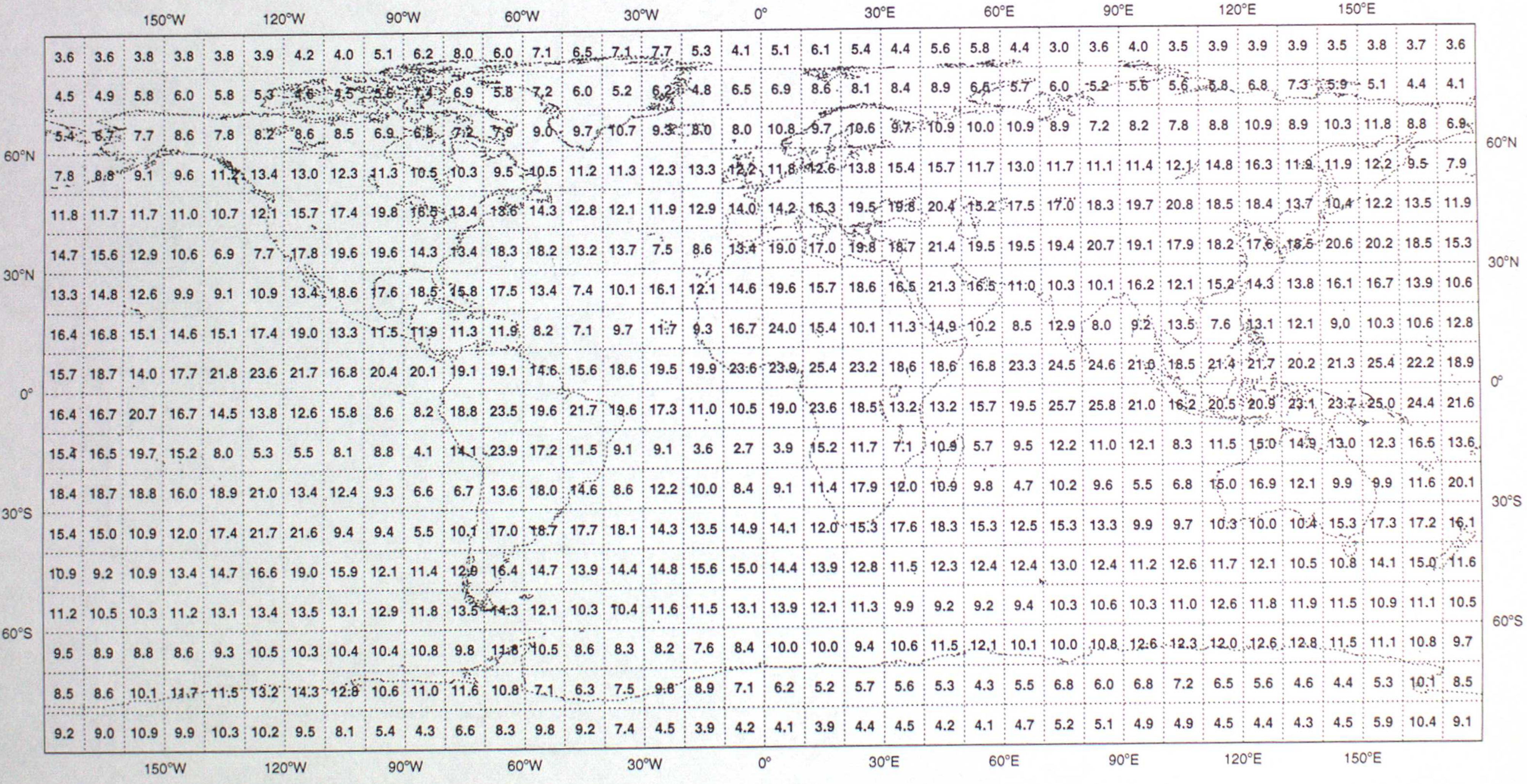

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .5 .6 .5 .5 .5 .4 .4 .4 .4 .5 .4 .5 .5 .5 .5 .5 .5 .5
.4 .4 .4 .5 .5 .4 .4 .4 .5 .6 .6 .5 .5 .5 .5 .6 .5 .4 .5 .6 .6 .8 .7 .6 .5 .4 .4 .5 .5 .5 .5 .6 .6 .6 .5 .4
.5 .4 .5 .5 .5 .6 .7 1.0 .9 .8 .7 .6 .7 .8 .9 .9 .7 .6 .7 .7 .9 .8 1.0 .8 1.0 .8 .7 .7 .7 .7 1.1 .9 1.0 1.4 .8 .6
.6 .8 .8 .8 .7 1.1 1.1 1.2 1.1 1.1 1.1 1.1 1.2 1.3 1.2 1.4 1.1 .7 .6 .9 1.0 1.5 1.4 .8 .9 .8 .9 .9 1.0 1.5 1.7 1.6 1.2 1.2 1.1 1.0
1.4 1.8 1.6 1.2 1.0 1.0 1.4 1.7 2.0 1.7 1.4 1.5 1.6 1.4 1.3 1.2 1.2 1.1 1.3 1.4 1.6 1.9 2.2 1.4 1.3 1.6 1.6 1.8 2.0 1.9 1.9 1.4 1.0 1.5 2.0 1.6
1.5 1.9 1.6 1.0 .9 .7 1.7 2.2 2.0 1.4 1.3 2.0 2.2 1.1 1.1 1.0 .8 .8 1.5 1.5 2.0 1.4 2.1 2.0 1.6 1.9 2.6 2.8 2.1 2.5 2.4 1.9 2.8 2.7 2.5 1.7
2.0 1.9 1.6 1.1 1.0 1.2 1.6 2.0 2.1 2.3 1.4 1.7 1.8 .9 .9 2.4 1.4 1.1 1.3 1.0 1.5 1.8 1.9 1.6 .9 .8 1.1 2.1 1.3 1.8 1.5 1.3 2.1 1.8 1.4 1.3
3.0 2.6 2.3 2.1 2.4 2.7 2.7 1.9 1.6 2.0 1.7 2.0 1.3 1.3 1.4 1.2 .9 2.3 3.7 2.5 1.5 .9 1.3 1.3 1.4 2.5 1.6 1.8 2.7 1.3 2.8 2.0 1.8 1.8 1.9 2.3
2.3 3.1 2.1 3.1 3.8 4.1 3.7 2.7 3.3 3.6 3.3 3.5 2.3 2.4 3.1 3.2 3.3 4.5 4.7 5.4 4.9 3.0 3.1 2.7 4.2 4.9 4.9 4.0 3.7 4.5 4.6 4.1 4.2 5.3 4.4 3.5
2.8 3.1 3.5 2.7 2.4 2.3 1.8 2.3 1.2 1.2 3.4 4.4 3.8 4.0 3.3 3.1 1.7 1.7 3.4 4.9 3.6 2.1 2.2 2.5 3.4 5.2 5.1 4.1 3.4 3.9 4.0 4.9 4.9 5.0 4.7 4.0
2.7 2.7 3.5 2.6 1.1 .9 .6 1.0 1.2 .5 2.4 4.0 2.9 1.8 1.4 1.6 .7 .4 .7 2.4 1.2 .8 1.6 .8 1.4 2.2 2.3 2.4 1.6 2.3 2.4 2.7 2.5 2.1 2.9 2.0
2.4 2.7 2.5 2.0 2.1 3.1 1.7 .9 1.0 .6 .7 1.7 2.4 1.7 1.1 1.5 1.1 .9 .7 .9 1.6 1.1 1.0 1.1 .6 .8 .8 .4 .5 2.0 1.1 .8 .6 .7 1.2 2.2
1.6 1.6 1.0 1.1 2.0 3.2 2.6 .9 .8 .6 1.0 2.1 2.2 2.0 2.1 1.4 1.4 1.8 1.6 1.1 1.5 1.8 2.1 1.9 1.2 1.2 1.2 1.0 1.0 .7 .7 .7 1.0 1.4 1.6 1.5
.8 .7 .8 1.1 1.4 1.8 2.2 1.7 1.3 1.1 1.8 1.7 1.8 1.4 1.7 1.9 1.7 2.0 1.9 1.7 1.4 1.1 1.4 1.5 1.2 1.3 1.1 1.0 1.0 1.0 1.0 .8 .9 1.3 1.4 1.1
.8 .9 .9 .9 1.0 1.4 1.5 1.6 1.7 1.6 1.6 1.7 1.3 .9 .8 1.0 1.0 1.4 1.7 1.6 1.4 1.1 1.3 1.2 1.0 1.2 1.1 .9 1.0 .9 1.0 1.1 1.1 1.1 1.1 .9
1.0 1.0 .9 .8 .7 1.0 1.0 1.2 1.3 1.4 1.0 1.2 1.3 1.0 1.0 .9 .7 .8 1.2 1.2 .9 1.2 1.1 1.1 .7 .7 .7 1.1 1.1 1.2 1.2 1.3 1.3 1.4 1.4 1.1
.8 .9 1.0 .9 1.1 1.3 1.3 1.2 1.0 .8 .8 1.0 .9 .7 .8 .8 .6 .5 .5 .5 .6 .7 .5 .4 .6 .8 .9 .9 .8 .7 .8 .7 .8 .8 .7 .7
.7 .8 1.0 1.2 1.6 1.7 1.7 1.4 1.1 1.0 .8 .7 .7 .7 .7 .7 .6 .5 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .4 .5 .6 .7 .7

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001

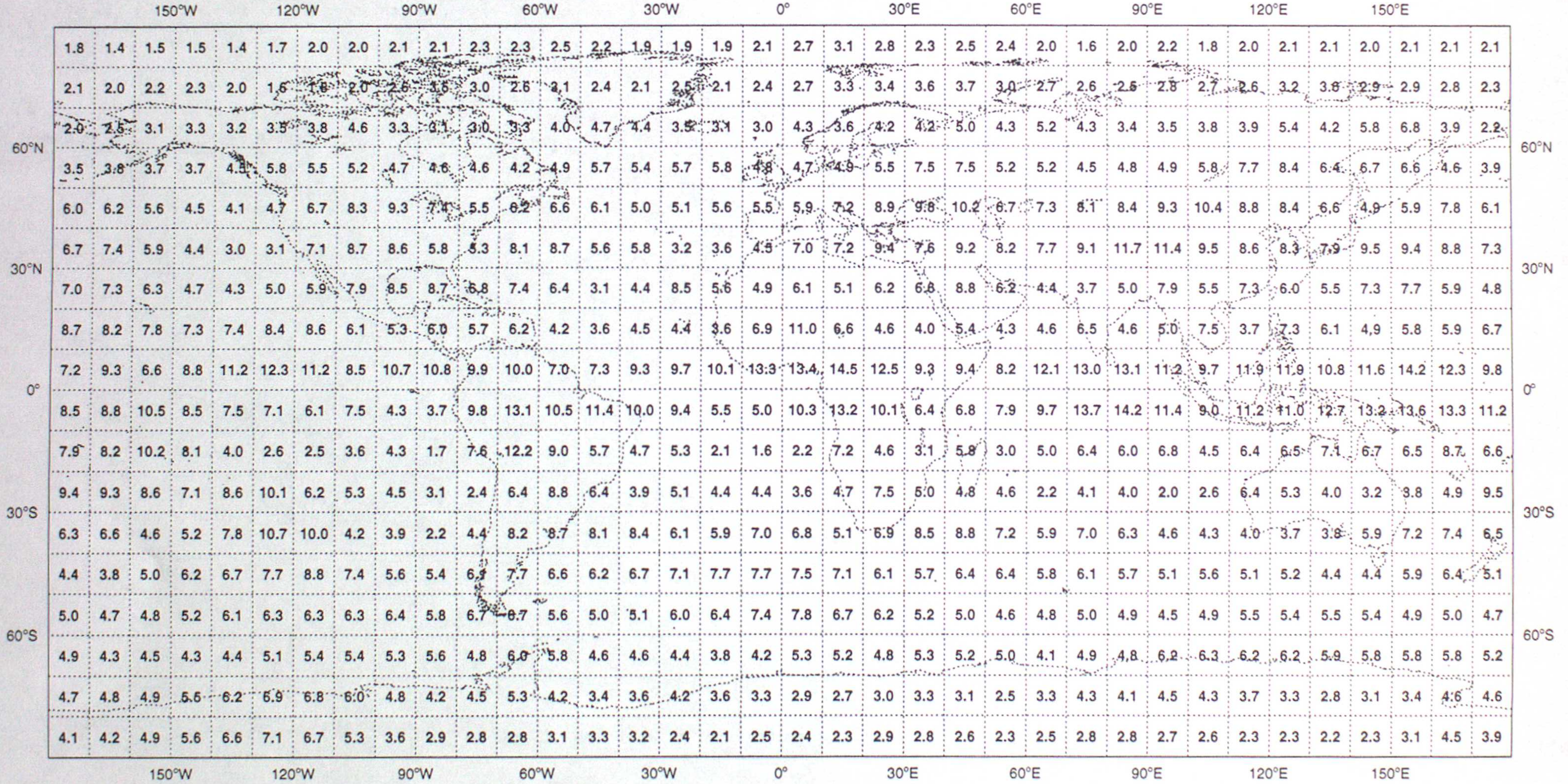
Channel: AMSUA-5 (700 hPa)

NOAA16, using all observations



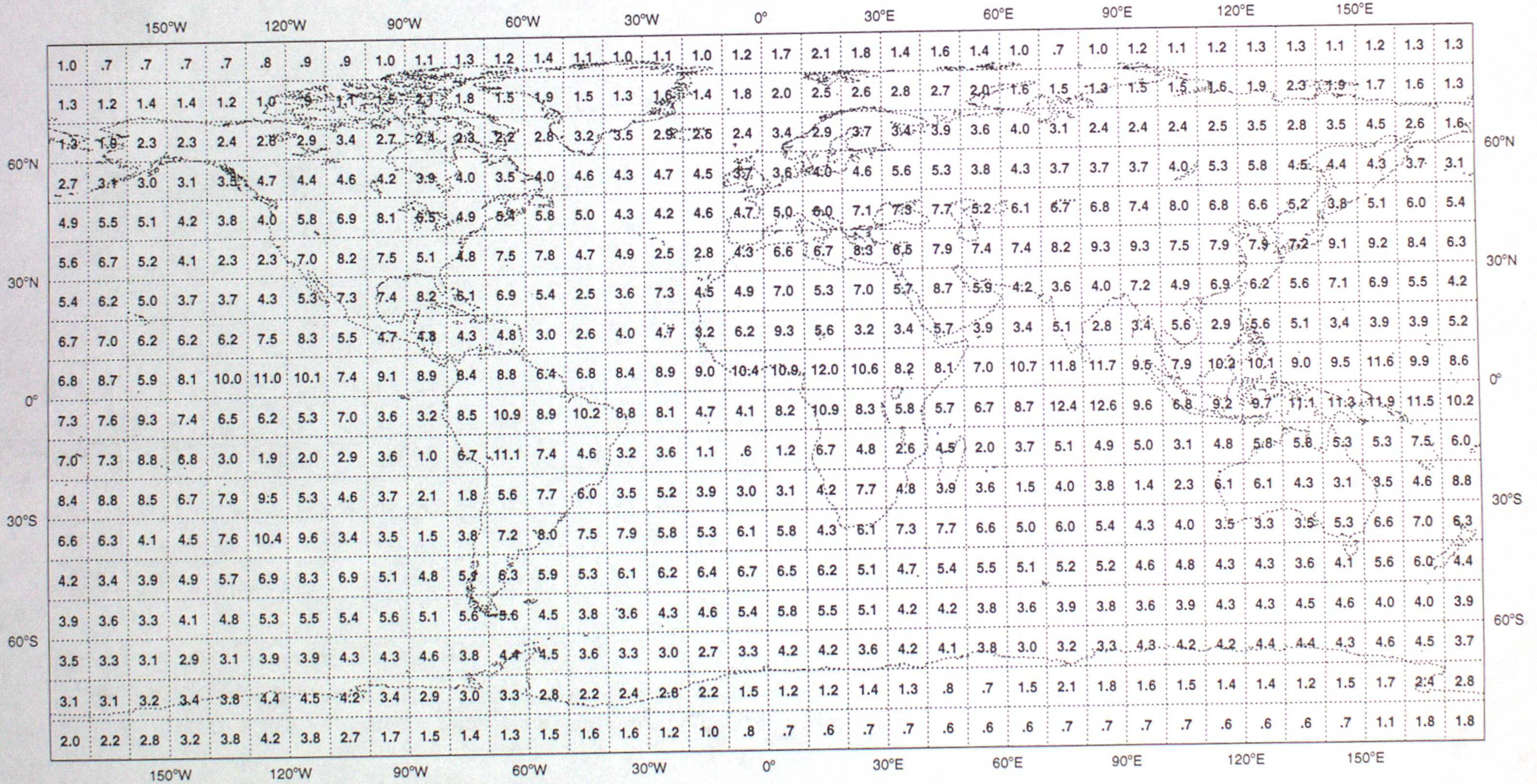
3.6	3.6	3.8	3.8	3.8	3.9	4.2	4.0	5.1	6.2	8.0	6.0	7.1	6.5	7.1	7.7	5.3	4.1	5.1	6.1	5.4	4.4	5.6	5.8	4.4	3.0	3.6	4.0	3.5	3.9	3.9	3.9	3.5	3.8	3.7	3.6
4.5	4.9	5.8	6.0	5.8	5.3	4.6	4.5	5.6	7.4	6.9	5.8	7.2	6.0	5.2	6.2	4.8	6.5	6.9	8.6	8.1	8.4	8.9	6.6	5.7	6.0	5.2	5.6	5.6	5.8	6.8	7.3	5.9	5.1	4.4	4.1
5.4	6.7	7.7	8.6	7.8	8.2	8.6	8.5	6.9	6.8	7.2	7.9	9.0	9.7	10.7	9.3	8.0	8.0	10.8	9.7	10.6	9.7	10.9	10.0	10.9	8.9	7.2	8.2	7.8	8.8	10.9	8.9	10.3	11.8	8.8	6.9
7.8	8.8	9.1	9.6	11.2	13.4	13.0	12.3	11.3	10.5	10.3	9.5	10.5	11.2	11.3	12.3	13.3	12.2	11.8	12.6	13.8	15.4	15.7	11.7	13.0	11.7	11.1	11.4	12.1	14.8	16.3	11.9	11.9	12.2	9.5	7.9
11.8	11.7	11.7	11.0	10.7	12.1	15.7	17.4	19.8	16.5	13.4	18.6	14.3	12.8	12.1	11.9	12.9	14.0	14.2	16.3	19.5	19.8	20.4	15.2	17.5	17.0	18.3	19.7	20.8	18.5	18.4	13.7	10.4	12.2	13.5	11.9
14.7	15.6	12.9	10.6	6.9	7.7	17.8	19.6	19.6	14.3	13.4	18.3	18.2	13.2	13.7	7.5	8.6	13.4	19.0	17.0	19.8	18.7	21.4	19.5	19.5	19.4	20.7	19.1	17.9	18.2	17.6	18.5	20.6	20.2	18.5	15.3
13.3	14.8	12.6	9.9	9.1	10.9	13.4	18.6	17.6	18.5	15.8	17.5	13.4	7.4	10.1	16.1	12.1	14.6	19.6	15.7	18.6	16.5	21.3	16.5	11.0	10.3	10.1	16.2	12.1	15.2	14.3	13.8	16.1	16.7	13.9	10.6
16.4	16.8	15.1	14.6	15.1	17.4	19.0	13.3	11.5	11.9	11.3	11.9	8.2	7.1	9.7	11.7	9.3	16.7	24.0	15.4	10.1	11.3	14.9	10.2	8.5	12.9	8.0	9.2	13.5	7.6	13.1	12.1	9.0	10.3	10.6	12.8
15.7	18.7	14.0	17.7	21.8	23.6	21.7	16.8	20.4	20.1	19.1	19.1	14.6	15.6	18.6	19.5	19.9	23.6	23.9	25.4	23.2	18.6	18.6	16.8	23.3	24.5	24.6	21.0	18.5	21.4	21.7	20.2	21.3	25.4	22.2	18.9
16.4	16.7	20.7	16.7	14.5	13.8	12.6	15.8	8.6	8.2	18.8	23.5	19.6	21.7	19.6	17.3	11.0	10.5	19.0	23.6	18.5	13.2	13.2	15.7	19.5	25.7	25.8	21.0	16.2	20.5	20.9	23.1	23.7	25.0	24.4	21.6
15.4	16.5	19.7	15.2	8.0	5.3	5.5	8.1	8.8	4.1	14.1	23.9	17.2	11.5	9.1	9.1	3.6	2.7	3.9	15.2	11.7	7.1	10.9	5.7	9.5	12.2	11.0	12.1	8.3	11.5	15.0	14.9	13.0	12.3	16.5	13.6
18.4	18.7	18.8	16.0	18.9	21.0	13.4	12.4	9.3	6.6	6.7	13.6	18.0	14.6	8.6	12.2	10.0	8.4	9.1	11.4	17.9	12.0	10.9	9.8	4.7	10.2	9.6	5.5	6.8	15.0	16.9	12.1	9.9	9.9	11.6	20.1
15.4	15.0	10.9	12.0	17.4	21.7	21.6	9.4	9.4	5.5	10.1	17.0	18.7	17.7	18.1	14.3	13.5	14.9	14.1	12.0	15.3	17.6	18.3	15.3	12.5	15.3	13.3	9.9	9.7	10.3	10.0	10.4	15.3	17.3	17.2	16.1
10.9	9.2	10.9	13.4	14.7	16.6	19.0	15.9	12.1	11.4	12.9	16.4	14.7	13.9	14.4	14.8	15.6	15.0	14.4	13.9	12.8	11.5	12.3	12.4	12.4	13.0	12.4	11.2	12.6	11.7	12.1	10.5	10.8	14.1	15.0	11.6
11.2	10.5	10.3	11.2	13.1	13.4	13.5	13.1	12.9	11.8	13.5	14.3	12.1	10.3	10.4	11.6	11.5	13.1	13.9	12.1	11.3	9.9	9.2	9.2	9.4	10.3	10.6	10.3	11.0	12.6	11.8	11.9	11.5	10.9	11.1	10.5
9.5	8.9	8.8	8.6	9.3	10.5	10.3	10.4	10.4	10.8	9.8	11.8	10.5	8.6	8.3	8.2	7.6	8.4	10.0	10.0	9.4	10.6	11.5	12.1	10.1	10.0	10.8	12.6	12.3	12.0	12.6	12.8	11.5	11.1	10.8	9.7
8.5	8.6	10.1	11.7	11.5	13.2	14.3	12.8	10.6	11.0	11.6	10.8	7.1	6.3	7.5	9.6	8.9	7.1	6.2	5.2	5.7	5.6	5.3	4.3	5.5	6.8	6.0	6.8	7.2	6.5	5.6	4.6	4.4	5.3	10.1	8.5
9.2	9.0	10.9	9.9	10.3	10.2	9.5	8.1	5.4	4.3	6.6	8.3	9.8	9.2	7.4	4.5	3.9	4.2	4.1	3.9	4.4	4.5	4.2	4.1	4.7	5.2	5.1	4.9	4.9	4.5	4.4	4.3	4.5	5.9	10.4	9.1

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



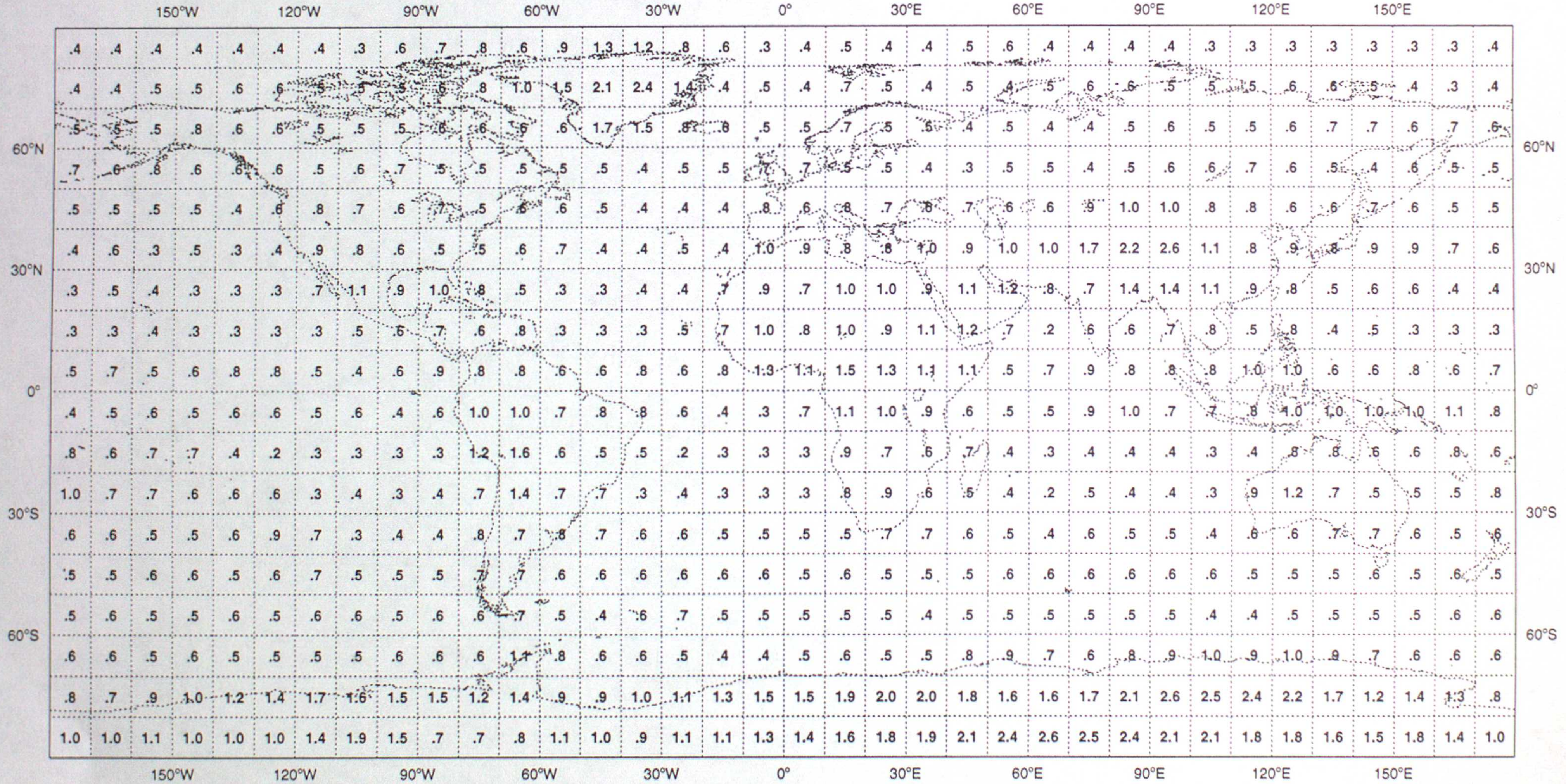
1.8	1.4	1.5	1.5	1.4	1.7	2.0	2.0	2.1	2.1	2.3	2.3	2.5	2.2	1.9	1.9	1.9	2.1	2.7	3.1	2.8	2.3	2.5	2.4	2.0	1.6	2.0	2.2	1.8	2.0	2.1	2.1	2.0	2.1	2.1	2.1
2.1	2.0	2.2	2.3	2.0	1.6	1.8	2.0	2.6	3.5	3.0	2.6	3.1	2.4	2.1	2.5	2.1	2.4	2.7	3.3	3.4	3.6	3.7	3.0	2.7	2.6	2.5	2.8	2.7	2.6	3.2	3.6	2.9	2.9	2.8	2.3
2.0	2.5	3.1	3.3	3.2	3.5	3.8	4.6	3.3	3.1	3.0	3.3	4.0	4.7	4.4	3.5	3.1	3.0	4.3	3.6	4.2	4.2	5.0	4.3	5.2	4.3	3.4	3.5	3.8	3.9	5.4	4.2	5.8	6.8	3.9	2.2
3.5	3.8	3.7	3.7	4.5	5.8	5.5	5.2	4.7	4.6	4.6	4.2	4.9	5.7	5.4	5.7	5.8	4.8	4.7	4.9	5.5	7.5	7.5	5.2	5.2	4.5	4.8	4.9	5.8	7.7	8.4	6.4	6.7	6.6	4.6	3.9
6.0	6.2	5.6	4.5	4.1	4.7	6.7	8.3	9.3	7.4	5.5	6.2	6.6	6.1	5.0	5.1	5.6	5.5	5.9	7.2	8.9	9.8	10.2	6.7	7.3	8.1	8.4	9.3	10.4	8.8	8.4	6.6	4.9	5.9	7.8	6.1
6.7	7.4	5.9	4.4	3.0	3.1	7.1	8.7	8.6	5.8	5.3	8.1	8.7	5.6	5.8	3.2	3.6	4.5	7.0	7.2	9.4	7.6	9.2	8.2	7.7	9.1	11.7	11.4	9.5	8.6	8.3	7.9	9.5	9.4	8.8	7.3
7.0	7.3	6.3	4.7	4.3	5.0	5.9	7.9	8.5	8.7	6.8	7.4	6.4	3.1	4.4	8.5	5.6	4.9	6.1	5.1	6.2	6.8	8.8	6.2	4.4	3.7	5.0	7.9	5.5	7.3	6.0	5.5	7.3	7.7	5.9	4.8
8.7	8.2	7.8	7.3	7.4	8.4	8.6	6.1	5.3	6.0	5.7	6.2	4.2	3.6	4.5	4.4	3.6	6.9	11.0	6.6	4.6	4.0	5.4	4.3	4.6	6.5	4.6	5.0	7.5	3.7	7.3	6.1	4.9	5.8	5.9	6.7
7.2	9.3	6.6	8.8	11.2	12.3	11.2	8.5	10.7	10.8	9.9	10.0	7.0	7.3	9.3	9.7	10.1	13.3	13.4	14.5	12.5	9.3	9.4	8.2	12.1	13.0	13.1	11.2	9.7	11.9	11.9	10.8	11.6	14.2	12.3	9.8
8.5	8.8	10.5	8.5	7.5	7.1	6.1	7.5	4.3	3.7	9.8	13.1	10.5	11.4	10.0	9.4	5.5	5.0	10.3	13.2	10.1	6.4	6.8	7.9	9.7	13.7	14.2	11.4	9.0	11.2	11.0	12.7	13.2	13.6	13.3	11.2
7.9	8.2	10.2	8.1	4.0	2.6	2.5	3.6	4.3	1.7	7.6	12.2	9.0	5.7	4.7	5.3	2.1	1.6	2.2	7.2	4.6	3.1	5.8	3.0	5.0	6.4	6.0	6.8	4.5	6.4	6.5	7.1	6.7	6.5	8.7	6.6
9.4	9.3	8.6	7.1	8.6	10.1	6.2	5.3	4.5	3.1	2.4	6.4	8.8	6.4	3.9	5.1	4.4	4.4	3.6	4.7	7.5	5.0	4.8	4.6	2.2	4.1	4.0	2.0	2.6	6.4	5.3	4.0	3.2	3.8	4.9	9.5
6.3	6.6	4.6	5.2	7.8	10.7	10.0	4.2	3.9	2.2	4.4	8.2	8.7	8.1	8.4	6.1	5.9	7.0	6.8	5.1	6.9	8.5	8.8	7.2	5.9	7.0	6.3	4.6	4.3	4.0	3.7	3.8	5.9	7.2	7.4	6.5
4.4	3.8	5.0	6.2	6.7	7.7	8.8	7.4	5.6	5.4	6.1	7.7	6.6	6.2	6.7	7.1	7.7	7.7	7.5	7.1	6.1	5.7	6.4	6.4	5.8	6.1	5.7	5.1	5.6	5.1	5.2	4.4	4.4	5.9	6.4	5.1
5.0	4.7	4.8	5.2	6.1	6.3	6.3	6.3	6.4	5.8	6.7	6.7	5.6	5.0	5.1	6.0	6.4	7.4	7.8	6.7	6.2	5.2	5.0	4.6	4.8	5.0	4.9	4.5	4.9	5.5	5.4	5.5	5.4	4.9	5.0	4.7
4.9	4.3	4.5	4.3	4.4	5.1	5.4	5.4	5.3	5.6	4.8	6.0	5.8	4.6	4.6	4.4	3.8	4.2	5.3	5.2	4.8	5.3	5.2	5.0	4.1	4.9	4.8	6.2	6.3	6.2	6.2	5.9	5.8	5.8	5.8	5.2
4.7	4.8	4.9	5.6	6.2	6.9	6.8	6.0	4.8	4.2	4.5	5.3	4.2	3.4	3.6	4.2	3.6	3.3	2.9	2.7	3.0	3.3	3.1	2.5	3.3	4.3	4.1	4.5	4.3	3.7	3.3	2.8	3.1	3.4	4.6	4.6
4.1	4.2	4.9	5.6	6.6	7.1	6.7	5.3	3.6	2.9	2.8	2.8	3.1	3.3	3.2	2.4	2.1	2.5	2.4	2.3	2.9	2.8	2.6	2.3	2.5	2.8	2.8	2.7	2.6	2.3	2.3	2.2	2.3	3.1	4.5	3.9

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



1.0	.7	.7	.7	.7	.8	.9	.9	1.0	1.1	1.3	1.2	1.4	1.1	1.0	1.1	1.0	1.2	1.7	2.1	1.8	1.4	1.6	1.4	1.0	.7	1.0	1.2	1.1	1.2	1.3	1.3	1.1	1.2	1.3	1.3
1.3	1.2	1.4	1.4	1.2	1.0	.9	1.1	1.5	2.1	1.8	1.5	1.9	1.5	1.3	1.6	1.4	1.8	2.0	2.5	2.6	2.8	2.7	2.0	1.6	1.5	1.3	1.5	1.5	1.6	1.9	2.3	1.9	1.7	1.6	1.3
1.3	1.9	2.3	2.3	2.4	2.8	2.9	3.4	2.7	2.4	2.3	2.2	2.8	3.2	3.5	2.9	2.5	2.4	3.4	2.9	3.7	3.4	3.9	3.6	4.0	3.1	2.4	2.4	2.4	2.5	3.5	2.8	3.5	4.5	2.6	1.6
2.7	3.1	3.0	3.1	3.5	4.7	4.4	4.6	4.2	3.9	4.0	3.5	4.0	4.6	4.3	4.7	4.5	3.7	3.6	4.0	4.6	5.6	5.3	3.8	4.3	3.7	3.7	3.7	4.0	5.3	5.8	4.5	4.4	4.3	3.7	3.1
4.9	5.5	5.1	4.2	3.8	4.0	5.8	6.9	8.1	6.5	4.9	5.4	5.8	5.0	4.3	4.2	4.6	4.7	5.0	6.0	7.1	7.3	7.7	5.2	6.1	6.7	6.8	7.4	8.0	6.8	6.6	5.2	3.8	5.1	6.0	5.4
5.6	6.7	5.2	4.1	2.3	2.3	7.0	8.2	7.5	5.1	4.8	7.5	7.8	4.7	4.9	2.5	2.8	4.3	6.6	6.7	8.3	6.5	7.9	7.4	7.4	8.2	9.3	9.3	7.5	7.9	7.9	7.2	9.1	9.2	8.4	6.3
5.4	6.2	5.0	3.7	3.7	4.3	5.3	7.3	7.4	8.2	6.1	6.9	5.4	2.5	3.6	7.3	4.5	4.9	7.0	5.3	7.0	5.7	8.7	5.9	4.2	3.6	4.0	7.2	4.9	6.9	6.2	5.6	7.1	6.9	5.5	4.2
6.7	7.0	6.2	6.2	6.2	7.5	8.3	5.5	4.7	4.8	4.3	4.8	3.0	2.6	4.0	4.7	3.2	6.2	9.3	5.6	3.2	3.4	5.7	3.9	3.4	5.1	2.8	3.4	5.6	2.9	5.6	5.1	3.4	3.9	3.9	5.2
6.8	8.7	5.9	8.1	10.0	11.0	10.1	7.4	9.1	8.9	8.4	8.8	6.4	6.8	8.4	8.9	9.0	10.4	10.9	12.0	10.6	8.2	8.1	7.0	10.7	11.8	11.7	9.5	7.9	10.2	10.1	9.0	9.5	11.6	9.9	8.6
7.3	7.6	9.3	7.4	6.5	6.2	5.3	7.0	3.6	3.2	8.5	10.9	8.9	10.2	8.8	8.1	4.7	4.1	8.2	10.9	8.3	5.8	5.7	6.7	8.7	12.4	12.6	9.6	6.8	9.2	9.7	11.1	11.3	11.9	11.5	10.2
7.0	7.3	8.8	6.8	3.0	1.9	2.0	2.9	3.6	1.0	6.7	11.1	7.4	4.6	3.2	3.6	1.1	.6	1.2	6.7	4.8	2.6	4.5	2.0	3.7	5.1	4.9	5.0	3.1	4.8	5.8	5.8	5.3	5.3	7.5	6.0
8.4	8.8	8.5	6.7	7.9	9.5	5.3	4.6	3.7	2.1	1.8	5.6	7.7	6.0	3.5	5.2	3.9	3.0	3.1	4.2	7.7	4.8	3.9	3.6	1.5	4.0	3.8	1.4	2.3	6.1	6.1	4.3	3.1	3.5	4.6	8.8
6.6	6.3	4.1	4.5	7.6	10.4	9.6	3.4	3.5	1.5	3.8	7.2	8.0	7.5	7.9	5.8	5.3	6.1	5.8	4.3	6.1	7.3	7.7	6.6	5.0	6.0	5.4	4.3	4.0	3.5	3.3	3.5	5.3	6.6	7.0	6.3
4.2	3.4	3.9	4.9	5.7	6.9	8.3	6.9	5.1	4.8	5.1	6.3	5.9	5.3	6.1	6.2	6.4	6.7	6.5	6.2	5.1	4.7	5.4	5.5	5.1	5.2	5.2	4.6	4.8	4.3	4.3	3.6	4.1	5.6	6.0	4.4
3.9	3.6	3.3	4.1	4.8	5.3	5.5	5.4	5.6	5.1	5.6	5.6	4.5	3.8	3.6	4.3	4.6	5.4	5.8	5.5	5.1	4.2	4.2	3.8	3.6	3.9	3.8	3.6	3.9	4.3	4.3	4.5	4.6	4.0	4.0	3.9
3.5	3.3	3.1	2.9	3.1	3.9	3.9	4.3	4.3	4.6	3.8	4.4	4.5	3.6	3.3	3.0	2.7	3.3	4.2	4.2	3.6	4.2	4.1	3.8	3.0	3.2	3.3	4.3	4.2	4.2	4.4	4.4	4.3	4.6	4.5	3.7
3.1	3.1	3.2	3.4	3.8	4.4	4.5	4.2	3.4	2.9	3.0	3.3	2.8	2.2	2.4	2.8	2.2	1.5	1.2	1.2	1.4	1.3	.8	.7	1.5	2.1	1.8	1.6	1.5	1.4	1.4	1.2	1.5	1.7	2.4	2.8
2.0	2.2	2.8	3.2	3.8	4.2	3.8	2.7	1.7	1.5	1.4	1.3	1.5	1.6	1.6	1.2	1.0	.8	.7	.6	.7	.7	.6	.6	.6	.7	.7	.7	.7	.6	.6	.6	.7	1.1	1.8	1.8

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



.4	.4	.4	.4	.4	.4	.4	.3	.6	.7	.8	.6	.9	1.3	1.2	.8	.6	.3	.4	.5	.4	.4	.5	.6	.4	.4	.4	.4	.3	.3	.3	.3	.3	.3	.3	.4
.4	.4	.5	.5	.6	.6	.5	.5	.5	.6	.8	1.0	1.5	2.1	2.4	1.4	.4	.5	.4	.7	.5	.4	.5	.4	.5	.6	.6	.5	.5	.5	.6	.6	.5	.4	.3	.4
.5	.5	.5	.8	.6	.6	.5	.5	.5	.6	.6	.6	.6	1.7	1.5	.8	.8	.5	.5	.7	.5	.5	.4	.5	.4	.4	.5	.6	.5	.5	.6	.7	.7	.6	.7	.6
.7	.6	.8	.6	.6	.6	.5	.6	.7	.5	.5	.5	.5	.5	.4	.5	.5	.7	.7	.5	.5	.4	.3	.5	.5	.4	.5	.6	.6	.7	.6	.5	.4	.6	.5	.5
.5	.5	.5	.5	.4	.6	.8	.7	.6	.7	.5	.6	.6	.5	.4	.4	.4	.8	.6	.8	.7	.8	.7	.6	.6	.9	1.0	1.0	.8	.8	.6	.6	.7	.6	.5	.5
.4	.6	.3	.5	.3	.4	.9	.8	.6	.5	.5	.6	.7	.4	.4	.5	.4	1.0	.9	.8	.8	1.0	.9	1.0	1.0	1.7	2.2	2.6	1.1	.8	.9	.8	.9	.9	.7	.6
.3	.5	.4	.3	.3	.3	.7	1.1	.9	1.0	.8	.5	.3	.3	.4	.4	.7	.9	.7	1.0	1.0	.9	1.1	1.2	.8	.7	1.4	1.4	1.1	.9	.8	.5	.6	.6	.4	.4
.3	.3	.4	.3	.3	.3	.3	.5	.6	.7	.6	.8	.3	.3	.3	.5	.7	1.0	.8	1.0	.9	1.1	1.2	.7	.2	.6	.6	.7	.8	.5	.8	.4	.5	.3	.3	.3
.5	.7	.5	.6	.8	.8	.5	.4	.6	.9	.8	.8	.6	.6	.8	.6	.8	1.3	1.1	1.5	1.3	1.1	1.1	.5	.7	.9	.8	.8	.8	1.0	1.0	.6	.6	.8	.6	.7
.4	.5	.6	.5	.6	.6	.5	.6	.4	.6	1.0	1.0	.7	.8	.8	.6	.4	.3	.7	1.1	1.0	.9	.6	.5	.5	.9	1.0	.7	.7	.8	1.0	1.0	1.0	1.0	1.1	.8
.8	.6	.7	.7	.4	.2	.3	.3	.3	.3	1.2	1.6	.6	.5	.5	.2	.3	.3	.3	.9	.7	.6	.7	.4	.3	.4	.4	.4	.3	.4	.8	.8	.6	.6	.8	.6
1.0	.7	.7	.6	.6	.6	.3	.4	.3	.4	.7	1.4	.7	.7	.3	.4	.3	.3	.3	.8	.9	.6	.5	.4	.2	.5	.4	.4	.3	.9	1.2	.7	.5	.5	.5	.8
.6	.6	.5	.5	.6	.9	.7	.3	.4	.4	.8	.7	.8	.7	.6	.6	.5	.5	.5	.5	.7	.7	.6	.5	.4	.6	.5	.5	.4	.6	.6	.7	.7	.6	.5	.6
.5	.5	.6	.6	.5	.6	.7	.5	.5	.5	.7	.7	.6	.6	.6	.6	.6	.6	.5	.6	.5	.5	.5	.6	.6	.6	.6	.6	.6	.5	.5	.5	.6	.5	.6	.5
.5	.6	.5	.5	.6	.5	.6	.6	.5	.6	.6	.7	.5	.4	.6	.7	.5	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.4	.4	.5	.5	.5	.5	.6	.6
.6	.6	.5	.6	.5	.5	.5	.5	.6	.6	.6	1.1	.8	.6	.6	.5	.4	.4	.5	.6	.5	.5	.8	.9	.7	.6	.8	.9	1.0	.9	1.0	.9	.7	.6	.6	.6
.8	.7	.9	1.0	1.2	1.4	1.7	1.6	1.5	1.5	1.2	1.4	.9	.9	1.0	1.1	1.3	1.5	1.5	1.9	2.0	2.0	1.8	1.6	1.6	1.7	2.1	2.6	2.5	2.4	2.2	1.7	1.2	1.4	1.3	.8
1.0	1.0	1.1	1.0	1.0	1.0	1.4	1.9	1.5	.7	.7	.8	1.1	1.0	.9	1.1	1.1	1.3	1.4	1.6	1.8	1.9	2.1	2.4	2.6	2.5	2.4	2.1	2.1	1.8	1.8	1.6	1.5	1.8	1.4	1.0

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). APRIL 2001
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

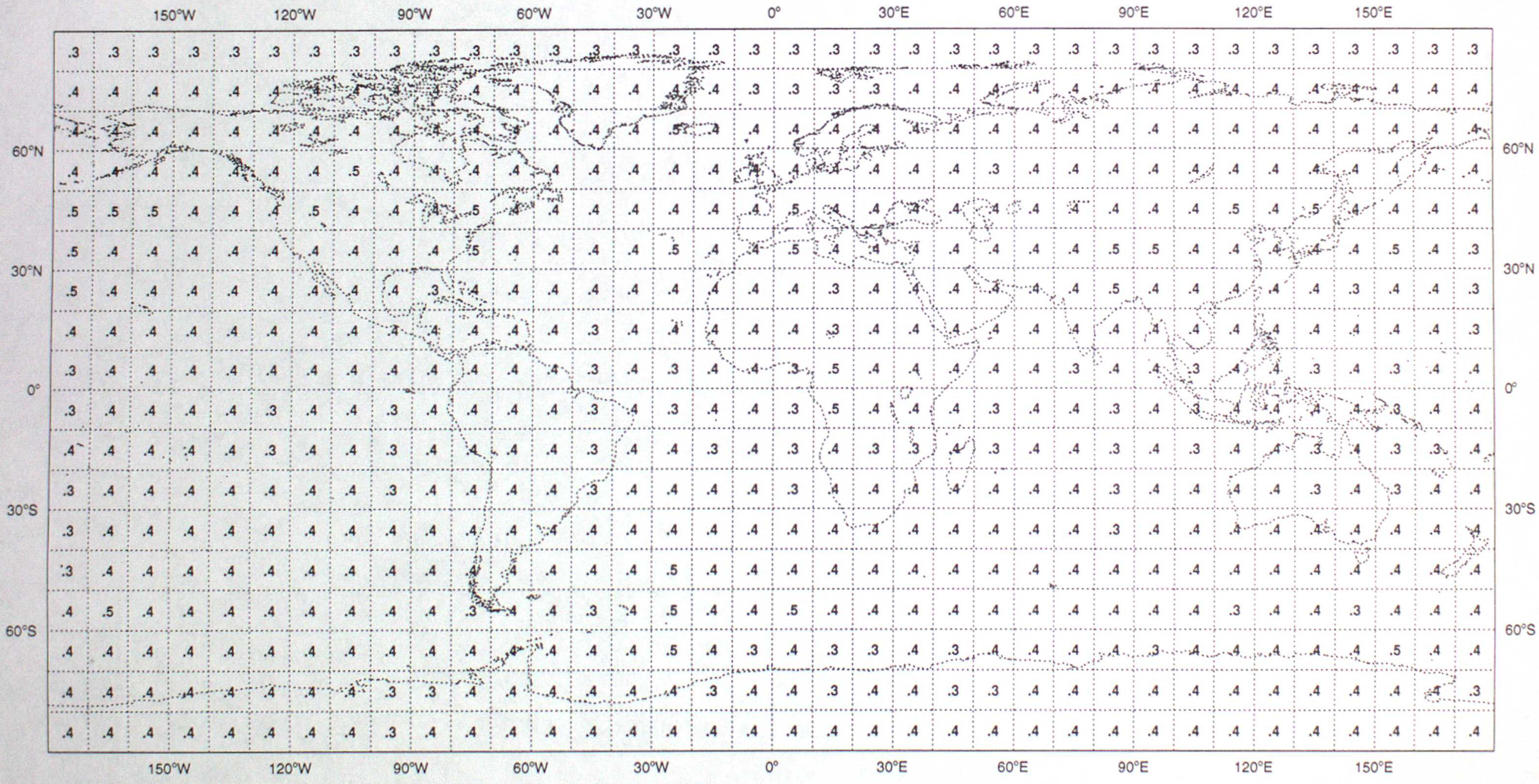
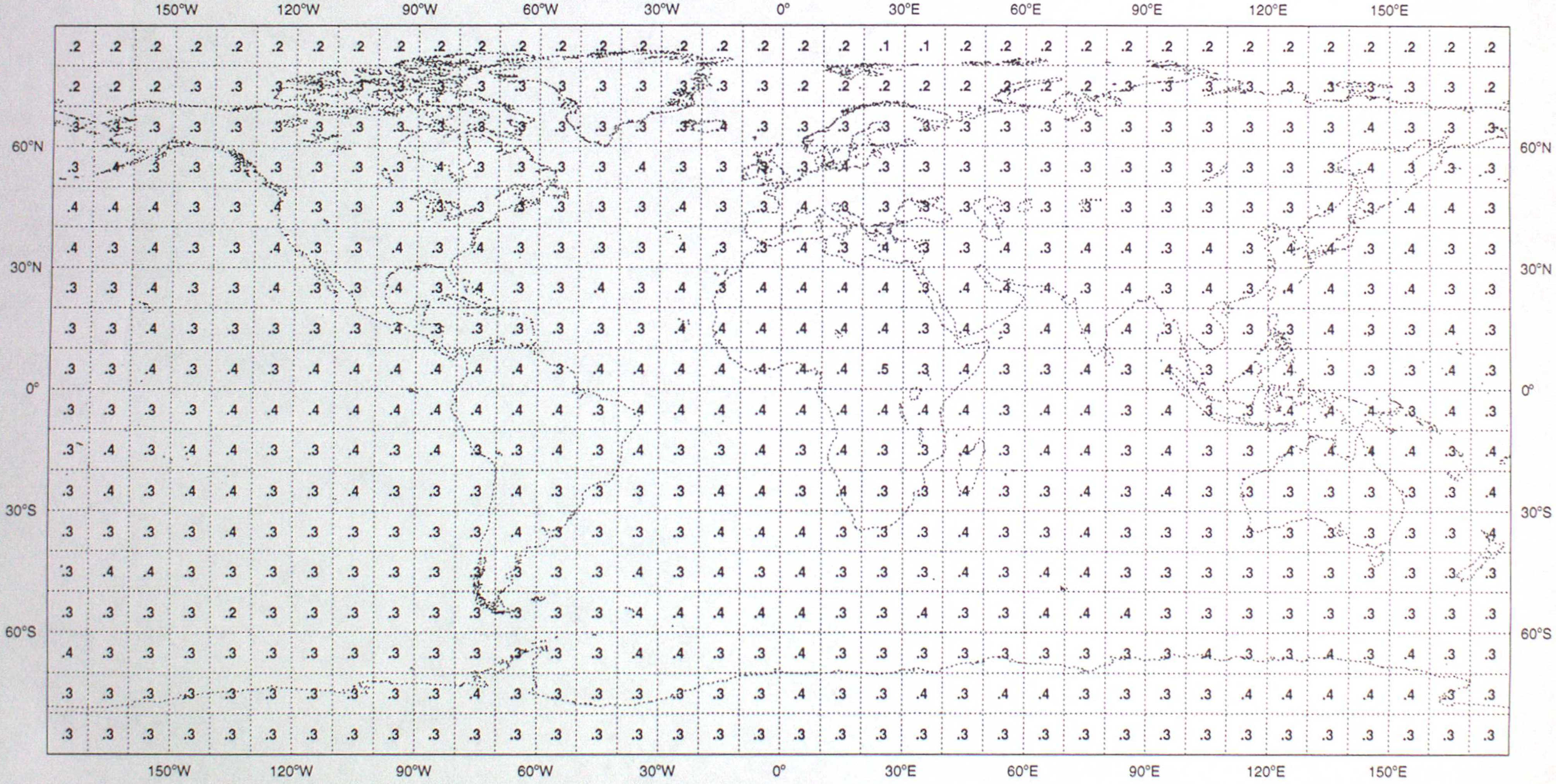

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). APRIL 2001
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2
.2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3
.3 .4 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3
.4 .4 .4 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .3
.4 .3 .4 .3 .3 .4 .3 .3 .4 .3 .4 .3 .3 .3 .3 .4 .3 .3 .4 .3 .4 .3 .3 .4 .3 .4 .4 .3 .4 .3 .4 .4 .3 .4 .3 .3
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.3 .3 .4 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .3 .4 .3 .4 .4 .4 .3 .3 .3 .3 .4 .3 .3 .4 .3
.3 .3 .4 .3 .4 .3 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .5 .3 .4 .3 .3 .4 .3 .4 .3 .4 .4 .3 .3 .3 .4 .3
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.3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .3 .3 .4 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3
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.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures
Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed ($m\ s^{-1}$)
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 $m\ s^{-1}$ (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13502	24.8	-20.6	ALL	P	SUR	195	0	0	0.5	-0.2	0.5
13505	18.3	-21.1	ALL	P	SUR	187	0	0	0.5	0.2	0.6
13506	18.3	-20.9	ALL	P	SUR	177	0	0	0.6	0.4	0.7
13507	17.1	-20.4	ALL	P	SUR	178	0	0	0.5	0.9	1.0
13509	13.7	-19.8	ALL	P	SUR	156	0	0	0.6	0.3	0.7
13510	13.6	-19.8	ALL	P	SUR	168	0	0	0.6	0.5	0.8
26510	78.9	-9.9	ALL	P	SUR	154	0	0	1.2	1.5	1.9
31535	17.9	-71.3	ALL	P	SUR	587	0	0	0.5	1.4	1.5
41502	24.6	-77.7	ALL	P	SUR	209	0	0	0.9	1.1	1.5
41504	24.3	-66.1	ALL	P	SUR	206	0	0	1.1	0.5	1.2
41505	27.5	-65.4	ALL	P	SUR	183	0	0	1.0	-1.5	1.8
41506	23.0	-75.7	ALL	P	SUR	160	0	0	0.9	0.9	1.3
41520	10.4	-36.1	ALL	P	SUR	168	0	0	0.4	0.9	1.0
41523	28.5	-58.4	ALL	P	SUR	328	0	0	0.6	0.1	0.6
41525	20.2	-39.9	ALL	P	SUR	177	0	0	0.4	0.3	0.6
41528	15.5	-40.9	ALL	P	SUR	165	0	0	0.4	0.5	0.6
41552	20.4	-39.7	ALL	P	SUR	286	0	0	0.5	0.3	0.5
41559	15.7	-40.5	ALL	P	SUR	274	0	0	0.5	0.3	0.6
41560	14.9	-35.5	ALL	P	SUR	267	0	0	0.4	0.5	0.7
41561	10.8	-36.8	ALL	P	SUR	263	0	0	0.5	0.1	0.5
41563	10.4	-30.1	ALL	P	SUR	277	0	0	0.5	0.4	0.6
41571	34.1	-42.6	ALL	P	SUR	494	1	0	0.6	0.5	0.8
41572	25.0	-55.1	ALL	P	SUR	620	0	0	0.5	-0.2	0.5
41595	23.5	-83.2	ALL	P	SUR	665	0	0	0.5	0.6	0.8
41611	17.8	-77.3	ALL	P	SUR	249	0	0	0.5	0.4	0.6
41613	19.7	-48.4	ALL	P	SUR	600	0	0	0.4	0.5	0.7
41616	20.6	-56.8	ALL	P	SUR	639	0	0	0.4	0.4	0.6
41639	21.7	-62.6	ALL	P	SUR	258	0	0	0.6	1.3	1.4
41642	23.0	-67.5	ALL	P	SUR	271	0	0	0.5	0.3	0.6
41644	30.1	-42.0	ALL	P	SUR	330	0	0	0.6	0.4	0.7
44507	43.5	-70.1	ALL	P	SUR	1	0	0	0.0	-1.5	1.5
44546	60.2	-30.3	ALL	P	SUR	934	0	0	1.0	-0.3	1.1
44548	45.3	-45.8	ALL	P	SUR	589	0	0	0.9	-1.1	1.4
44549	51.5	-44.3	ALL	P	SUR	687	0	0	1.1	-0.2	1.1
44550	47.3	-43.7	ALL	P	SUR	686	0	0	1.0	-0.3	1.0
44608	23.4	-43.9	ALL	P	SUR	1212	0	0	0.4	0.3	0.5
44610	58.5	-24.9	ALL	P	SUR	1660	0	0	1.2	0.4	1.3
44611	45.2	-2.4	ALL	P	SUR	630	0	0	0.6	0.9	1.1
44612	37.5	-29.1	ALL	P	SUR	1121	0	0	0.5	0.2	0.6
44613	33.4	-35.1	ALL	P	SUR	773	0	0	0.6	0.4	0.7
44616	50.8	-50.0	ALL	P	SUR	509	0	0	1.0	0.1	1.0
44620	28.3	-43.7	ALL	P	SUR	688	0	0	0.5	0.2	0.6
44621	55.1	-45.5	ALL	P	SUR	505	1	0	1.3	0.4	1.4
44623	35.1	-25.8	ALL	P	SUR	691	0	0	0.5	0.4	0.7
44624	44.1	-44.3	ALL	P	SUR	505	0	0	1.0	0.1	1.0
44625	46.5	-50.8	ALL	P	SUR	507	3	1	1.2	-0.4	1.3
44628	29.4	-16.0	ALL	P	SUR	571	4	1	1.0	0.8	1.3
44629	40.6	-49.4	ALL	P	SUR	507	0	0	0.9	-0.4	1.0
44721	37.3	-45.1	ALL	P	SUR	489	0	0	1.0	0.3	1.0
44722	41.1	-38.7	ALL	P	SUR	503	1	0	1.0	0.0	1.0
44724	34.4	-15.7	ALL	P	SUR	556	0	0	0.6	0.4	0.7
44725	48.3	-38.0	ALL	P	SUR	659	0	0	0.7	-0.2	0.7
44729	48.3	-9.4	ALL	P	SUR	650	0	0	0.8	0.7	1.0
44741	60.1	-43.3	ALL	P	SUR	688	0	0	1.0	0.4	1.0
44743	49.6	-1.6	ALL	P	SUR	34	1	3	0.5	0.3	0.6
44761	53.4	-20.1	ALL	P	SUR	817	0	0	0.8	0.0	0.8
44762	45.9	-7.8	ALL	P	SUR	524	0	0	0.6	0.6	0.9
44765	33.6	-37.5	ALL	P	SUR	619	4	1	0.7	0.3	0.8
44770	56.1	-17.5	ALL	P	SUR	547	0	0	0.8	0.3	0.8
44771	53.3	-35.3	ALL	P	SUR	684	0	0	0.8	0.2	0.8

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
44772	44.4	-4.8	ALL	P	SUR	1505	15	1	0.8	0.4	0.9
44774	47.4	-22.0	ALL	P	SUR	1528	17	1	1.0	0.2	1.0
44775	42.9	-53.1	ALL	P	SUR	655	0	0	1.2	-0.3	1.2
44776	48.3	-38.6	ALL	P	SUR	712	4	1	1.0	0.7	1.2
44778	46.1	-37.3	ALL	P	SUR	688	0	0	1.0	0.4	1.1
44807	43.5	-70.1	ALL	P	SUR	1	0	0	0.0	-0.9	0.9
44811	41.1	-66.6	ALL	P	SUR	2	0	0	0.2	-0.7	0.7
45808	43.5	-84.7	ALL	P	SUR	2	0	0	0.6	0.4	0.7
48581	67.4	-60.2	ALL	P	SUR	418	0	0	1.0	0.7	1.2
62501	39.9	-15.7	ALL	P	SUR	577	0	0	0.7	0.5	0.8
62503	39.3	-18.8	ALL	P	SUR	685	0	0	0.7	0.1	0.7
62504	39.3	-21.0	ALL	P	SUR	668	0	0	0.6	0.2	0.6
62505	41.9	-13.0	ALL	P	SUR	621	0	0	0.7	0.5	0.8
62510	42.3	-19.9	ALL	P	SUR	29	0	0	1.2	-0.7	1.4
62511	39.2	-19.7	ALL	P	SUR	102	0	0	0.7	0.1	0.7
62513	49.3	-10.5	ALL	P	SUR	18	0	0	1.4	-0.8	1.6
62514	56.6	-14.5	ALL	P	SUR	631	1	0	1.0	0.3	1.1
62564	40.2	-19.4	ALL	P	SUR	160	0	0	0.6	0.6	0.9
62596	61.8	-35.1	ALL	P	SUR	652	0	0	1.0	0.0	1.0
62701	50.6	-2.7	ALL	P	SUR	1	0	0	0.0	-1.6	1.6
62707	50.1	-6.0	ALL	P	SUR	1	0	0	0.0	0.3	0.3
62709	57.0	0.0	ALL	P	SUR	2	0	0	0.0	-0.4	0.4
62806	57.0	-9.9	ALL	P	SUR	1	0	0	0.0	-0.5	0.5
62807	50.1	-6.1	ALL	P	SUR	1	0	0	0.0	-0.9	0.9
62809	57.0	0.0	ALL	P	SUR	1	0	0	0.0	-0.5	0.5
62881	51.0	-13.3	ALL	P	SUR	1	0	0	0.0	-0.2	0.2
64517	56.2	-13.5	ALL	P	SUR	740	0	0	0.8	-0.5	0.9
64548	60.5	-4.3	ALL	P	SUR	1401	13	1	1.3	-0.6	1.4
64698	61.2	-30.0	ALL	P	SUR	1133	0	0	0.8	-0.3	0.8
64845	59.1	-11.4	ALL	P	SUR	1	0	0	0.0	-0.5	0.5
65593	58.9	-37.9	ALL	P	SUR	1880	9	0	1.1	-0.3	1.1
65595	55.6	-42.7	ALL	P	SUR	675	1	0	1.3	0.0	1.3
65600	60.7	-9.2	ALL	P	SUR	2303	6	0	0.9	-0.5	1.0
65602	57.4	-36.5	ALL	P	SUR	1607	13	1	1.2	-0.4	1.3
65662	56.1	-39.9	ALL	P	SUR	683	3	0	1.3	-0.2	1.3
65663	51.2	-40.3	ALL	P	SUR	552	7	1	1.5	-0.4	1.6
696001	45.9	-7.8	ALL	P	SUR	1	0	0	0.0	-1.4	1.4
WIND SPEED											
41502	24.6	-77.7	ALL	SPEED	SUR	129	0	0	2.7	-4.6	5.3
41504	24.3	-66.1	ALL	SPEED	SUR	60	0	0	1.3	-3.8	4.0
41506	23.0	-75.7	ALL	SPEED	SUR	57	0	0	2.3	-4.6	5.1
41552	20.4	-39.7	ALL	SPEED	SUR	284	1	0	1.7	0.0	1.7
41559	15.7	-40.5	ALL	SPEED	SUR	272	0	0	1.3	0.7	1.4
41560	14.9	-35.5	ALL	SPEED	SUR	260	0	0	1.5	-0.5	1.6
41561	10.8	-36.8	ALL	SPEED	SUR	261	0	0	1.2	-0.2	1.3
41563	10.4	-30.1	ALL	SPEED	SUR	274	0	0	1.8	0.4	1.9
41639	21.7	-62.6	ALL	SPEED	SUR	247	0	0	4.0	3.2	5.1
41642	23.0	-67.5	ALL	SPEED	SUR	264	0	0	2.7	0.6	2.7
44610	58.5	-24.9	ALL	SPEED	SUR	1	0	0	0.0	1.2	1.2
44811	41.1	-66.6	ALL	SPEED	SUR	2	0	0	0.4	-0.8	0.9
62504	39.3	-21.0	ALL	SPEED	SUR	667	0	0	1.4	-0.2	1.4
62506	30.9	-27.3	ALL	SPEED	SUR	570	0	0	1.7	-2.9	3.3
62552	46.2	-17.9	ALL	SPEED	SUR	503	0	0	1.8	-0.2	1.8
62555	41.6	-17.5	ALL	SPEED	SUR	137	0	0	1.2	-0.1	1.2
62556	39.5	-22.3	ALL	SPEED	SUR	520	0	0	1.3	-0.1	1.3
62557	41.3	-11.6	ALL	SPEED	SUR	455	0	0	1.1	0.5	1.2
62558	46.1	-20.8	ALL	SPEED	SUR	503	0	0	1.9	-1.1	2.2
62559	44.4	-20.1	ALL	SPEED	SUR	280	0	0	1.3	-0.1	1.3

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IDENTIFIER   LAT.   LONG.   HOUR   ELEM    LEVEL NOBS   NGE   PGE    SD    BIAS    RMS

WIND SPEED

62560        42.2   -13.0   ALL    SPEED   SUR   397     0     0    1.5    -0.5    1.6
62564        40.2   -19.4   ALL    SPEED   SUR   415     0     0    3.1    -1.2    3.3
62565        42.0   -13.4   ALL    SPEED   SUR   332     0     0    1.2    -0.1    1.2
62566        42.7   -16.8   ALL    SPEED   SUR   473     0     0    1.4    -0.2    1.5
62567        41.3   -16.1   ALL    SPEED   SUR   454     0     0    1.3    -0.1    1.3

62569        40.3   -15.0   ALL    SPEED   SUR   508     0     0    1.1     0.2    1.1
62570        44.8   -21.6   ALL    SPEED   SUR   564     0     0    1.6    -0.1    1.6
62571        41.6   -14.4   ALL    SPEED   SUR   385     0     0    1.5    -0.1    1.5
62572        42.7   -20.4   ALL    SPEED   SUR   436     0     0    1.2    -0.3    1.3
62707        50.1    -6.0   ALL    SPEED   SUR     1     0     0    0.0    -2.6    2.6

62806        57.0    -9.9   ALL    SPEED   SUR     1     0     0    0.0     0.4    0.4
62807        50.1    -6.1   ALL    SPEED   SUR     1     0     0    0.0     1.4    1.4
646735       26.5   -79.2   ALL    SPEED   SUR     1     0     0    0.0     0.0    0.0
64845        59.1   -11.4   ALL    SPEED   SUR     1     0     0    0.0     0.7    0.7
65602        57.4   -36.5   ALL    SPEED   SUR     1     0     0    0.0    -9.4    9.4

696001       45.9    -7.8   ALL    SPEED   SUR     1     0     0    0.0     0.8    0.8
807610       26.1   -78.5   ALL    SPEED   SUR     1     0     0    0.0     3.9    3.9
827086       26.3   -79.0   ALL    SPEED   SUR     1     0     0    0.0     2.8    2.8
867834       26.6   -79.1   ALL    SPEED   SUR     1     0     0    0.0     1.4    1.4

WIND DIRECTION

41552        20.4   -39.7   ALL    DIRN.   SUR   177     1     1   13.4    17.2   21.8
41559        15.7   -40.5   ALL    DIRN.   SUR   238     0     0   10.0    -2.9   10.4
41560        14.9   -35.5   ALL    DIRN.   SUR   255     0     0   10.6    17.0   20.1
41561        10.8   -36.8   ALL    DIRN.   SUR   260     0     0   10.6     0.5   10.6
41563        10.4   -30.1   ALL    DIRN.   SUR   270     0     0   16.8     4.6   17.5

41639        21.7   -62.6   ALL    DIRN.   SUR   175     0     0   18.7    -8.4   20.5
41642        23.0   -67.5   ALL    DIRN.   SUR   170     0     0   21.3     5.9   22.1
44610        58.5   -24.9   ALL    DIRN.   SUR     1     0     0    0.0   141.8  141.8
44811        41.1   -66.6   ALL    DIRN.   SUR     1     0     0    0.0    -2.5    2.5
62504        39.3   -21.0   ALL    DIRN.   SUR   460     0     0   14.2    -3.4   14.6

62506        30.9   -27.3   ALL    DIRN.   SUR    29     0     0   16.7    26.3   31.2
62552        46.2   -17.9   ALL    DIRN.   SUR   287     0     0   26.6    -3.5   26.8
62555        41.6   -17.5   ALL    DIRN.   SUR   121     0     0   12.3   -13.1   18.0
62556        39.5   -22.3   ALL    DIRN.   SUR   308     0     0   12.4    11.2   16.7
62557        41.3   -11.6   ALL    DIRN.   SUR   339     0     0    9.5    -7.4   12.1

62558        46.1   -20.8   ALL    DIRN.   SUR   291     0     0   15.4    -8.9   17.8
62559        44.4   -20.1   ALL    DIRN.   SUR   214     0     0    9.0   -14.5   17.1
62560        42.2   -13.0   ALL    DIRN.   SUR   303     0     0   18.9    -6.4   19.9
62564        40.2   -19.4   ALL    DIRN.   SUR   229     0     0   10.8     1.4   10.9
62565        42.0   -13.4   ALL    DIRN.   SUR   264     0     0   10.7    -9.1   14.0

62566        42.7   -16.8   ALL    DIRN.   SUR   330     0     0   12.0    -4.9   13.0
62567        41.3   -16.1   ALL    DIRN.   SUR   345     0     0   10.1     2.2   10.3
62569        40.3   -15.0   ALL    DIRN.   SUR   401     0     0   11.0    -5.3   12.2
62570        44.8   -21.6   ALL    DIRN.   SUR   402     0     0   16.0     0.2   16.0
62571        41.6   -14.4   ALL    DIRN.   SUR   287     0     0   12.6    -4.9   13.5

62572        42.7   -20.4   ALL    DIRN.   SUR   316     0     0   10.8     0.3   10.8
62707        50.1    -6.0   ALL    DIRN.   SUR     1     0     0    0.0    21.8   21.8
62807        50.1    -6.1   ALL    DIRN.   SUR     1     0     0    0.0     3.6    3.6
64845        59.1   -11.4   ALL    DIRN.   SUR     1     0     0    0.0    -6.6    6.6
807610       26.1   -78.5   ALL    DIRN.   SUR     1     0     0    0.0    13.7   13.7

827086       26.3   -79.0   ALL    DIRN.   SUR     1     0     0    0.0    25.0   25.0
867834       26.6   -79.1   ALL    DIRN.   SUR     1     0     0    0.0    27.4   27.4
```

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures:
Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	2024	1	4	1.5	0.1	2015	0	4	0	7.6	0.7
ACA	1628	0	3	1.4	0.0	1639	0	3	0	5.9	0.9
AEA	320	1	4	1.6	0.1	316	0	4	0	8.0	1.0
AEL	293	0	11	2.0	-0.6	297	0	13	0	8.8	0.1
AEY	42	2	2	1.6	1.0	44	0	0	0	6.1	1.3
AFL	297	1	4	2.2	0.5	296	0	3	0	7.2	0.8
AFR	910	1	8	1.7	0.1	921	1	8	0	7.6	0.5
AIH	173	0	3	1.6	0.1	175	0	5	0	8.6	1.3
AJM	125	1	2	1.5	0.1	128	1	2	0	6.7	0.5
ALM	64	3	16	1.7	0.2	67	0	10	0	6.5	1.1
AMM	115	0	3	1.4	0.5	119	3	6	0	6.9	0.5
AMX	179	3	5	2.0	0.6	175	1	3	0	9.2	1.8
ANZ	83	0	48	2.1	-1.0	83	0	48	0	6.3	1.3
AVA	77	1	3	1.9	0.9	78	1	3	0	9.4	0.4
AZA	544	2	6	2.0	0.2	552	0	7	0	8.6	0.6
BAF	21	0	0	1.7	-1.1	21	0	0	0	6.3	1.8
BAL	101	1	10	1.5	0.1	100	0	10	0	8.7	0.3
BAW	740	1	9	1.9	-0.1	753	0	9	0	6.9	0.8
BBB	35	3	6	1.2	0.3	36	0	6	0	6.7	1.1
BWA	55	0	51	2.0	1.2	54	0	7	0	7.3	1.3
CFG	428	0	2	1.4	-0.7	422	0	4	0	7.9	0.8
CKS	27	0	0	2.1	0.6	27	0	0	0	7.4	1.6
CLX	256	0	1	1.5	-0.3	256	0	2	0	5.5	0.9
CMM	102	1	1	1.4	-0.3	104	0	0	0	4.9	1.4
COA	427	1	10	1.3	-0.3	419	0	13	0	10.6	1.9
CRL	354	0	3	2.2	1.3	357	0	5	0	7.5	0.4
CUB	102	0	4	2.1	0.8	107	0	7	0	11.6	-1.0
DAL	985	0	17	1.6	-0.5	1002	0	19	0	7.6	0.6
DBY	209	0	3	1.5	-0.2	211	0	4	0	7.6	0.0
DLH	1440	0	5	1.5	0.0	1421	0	6	0	6.7	0.8
EDW	32	0	9	1.9	0.2	34	0	9	0	10.6	0.5
EEZ	73	0	100	3.4	2.2	71	0	8	0	7.0	-0.5
ELY	90	2	8	1.2	0.5	91	0	8	0	6.6	1.5
EWW	123	0	3	1.5	0.2	121	1	4	0	6.9	1.7
FDX	618	1	31	1.6	0.4	644	0	31	0	7.6	1.0
FIN	306	0	4	1.5	0.3	302	0	5	0	7.1	0.4
GAF	83	0	7	1.3	-0.8	84	0	8	0	8.5	1.7
GCO	62	0	8	2.0	0.4	62	0	100	0	17.6	4.5
GRL	36	0	3	1.9	-0.7	36	0	0	0	3.7	0.8
GTI	70	0	7	2.1	-1.1	71	0	8	0	5.5	1.5
HLF	72	0	6	1.4	-0.5	73	0	7	0	6.6	0.8
HZM	29	0	14	4.8	4.1	28	0	14	0	12.7	-0.5
IBE	1331	1	8	1.6	0.1	1325	0	10	0	9.3	0.8
ICE	1076	0	3	1.4	0.1	1053	0	3	0	6.4	0.8
IWD	30	0	3	1.8	-0.3	29	0	0	0	6.1	0.7
JKK	246	0	10	1.4	0.1	236	0	14	0	8.9	1.5
JMC	69	0	0	1.3	0.9	66	0	2	0	7.3	-0.7
KLM	1396	0	6	1.6	0.0	1409	0	7	0	6.7	0.4
LDA	40	3	5	1.3	-0.3	38	0	5	0	5.7	0.4
LDI	441	0	4	1.7	-0.5	450	1	5	0	8.1	0.2
LIB	446	0	8	1.8	0.8	464	0	9	0	8.4	0.4
LOT	145	0	3	1.8	-1.1	145	1	3	0	6.9	1.5
LTU	242	0	2	1.3	-0.2	248	0	2	0	6.8	1.1
MON	72	0	0	1.2	0.3	71	0	0	0	3.9	0.7
MPD	141	1	6	1.5	-0.2	141	0	5	0	6.7	1.5
MPH	322	0	4	1.6	-0.6	325	1	5	0	7.6	0.6
NCA	31	0	0	1.0	-0.1	31	0	0	0	4.7	0.8
NVR	22	0	0	1.8	-0.5	22	0	0	0	5.6	0.9
NWA	3608	0	2	1.5	0.4	3625	0	2	0	6.6	0.7

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
OAE	47	0	11	1.8	-0.5	45	0	16	0	15.0	4.7
OAL	24	0	0	1.4	-0.3	33	0	3	0	6.1	0.9
PAC	131	1	6	1.6	0.3	129	1	7	0	6.4	-0.2
RAM	41	2	5	1.8	-0.5	41	0	7	0	9.5	0.6
RCH	73	5	12	1.9	0.4	71	0	100	0	13.2	4.3
RRR	68	1	7	1.7	0.2	68	0	7	0	8.0	0.8
RZO	58	0	9	1.2	-0.1	60	2	12	0	6.4	0.9
SIA	31	0	10	1.1	-0.1	31	3	13	0	7.3	0.8
SLR	85	0	8	1.2	0.0	88	0	10	0	6.6	0.1
SVA	48	0	6	1.9	0.6	56	0	7	0	8.9	2.0
SWR	53	0	26	2.7	0.0	53	0	28	0	14.1	4.0
TAP	376	0	4	1.6	-0.2	376	0	4	0	8.4	0.8
TSC	39	0	10	2.2	0.0	38	0	32	0	10.3	3.9
TWA	206	0	3	1.6	0.2	200	0	3	0	6.9	0.7
UAL	1472	1	100	1.7	-0.3	1480	0	100	0	5.3	0.8
UPS	831	0	31	1.8	0.4	834	0	32	0	8.0	0.8
USA	187	0	7	1.4	-0.1	156	0	8	0	7.8	1.3
VIR	414	1	4	1.5	0.0	425	0	4	0	6.2	1.1
VKG	41	2	7	1.0	0.2	42	0	12	0	10.1	1.3
WOA	21	0	0	1.1	0.2	23	0	9	0	13.2	0.1
EU	23365	0	16	1.2	0.0	23365	0	16	0	4.4	0.6
KL	2105	12	20	1.5	1.0	2092	0	20	0	14.2	2.3
LH	501	0	13	1.4	0.9	501	0	13	0	4.4	1.5
N	263	0	2	1.7	0.1	272	0	4	0	8.1	1.3
US ACARS	28023	6	33	1.3	0.3	28023	0	27	0	4.9	0.8

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DASAP3	12	Z	100	1	0	0.0	1.0	-1.0
DBBH	12	Z	100	16	0	7.9	28.7	27.6
EHOA	12	Z	100	16	0	15.1	51.0	48.8
ELML7	00	Z	100	12	0	11.2	40.7	39.2
ELML7	12	Z	100	12	0	18.8	28.6	21.5
FNCM	00	Z	100	10	0	10.3	43.9	42.7
FNCM	12	Z	100	12	0	11.2	28.0	25.7
FNOR	00	Z	100	11	0	6.5	31.5	30.8
FNOR	12	Z	100	11	0	11.8	30.3	27.9
FNOU	00	Z	100	10	0	11.8	34.5	32.4
FNOU	12	Z	100	14	0	10.6	27.6	25.4
FNPH	00	Z	100	12	0	13.7	35.5	32.8
FNPH	12	Z	100	10	0	34.8	38.8	17.3
FNRS	00	Z	100	10	0	7.8	22.4	21.0
FNRS	12	Z	100	12	0	11.4	23.6	20.7
LDWR	00	Z	100	29	0	6.5	6.7	-1.9
LDWR	12	Z	100	29	0	10.3	14.6	-10.4
OVYA2	00	Z	100	7	0	16.9	19.1	8.9
OVYA2	12	Z	100	8	0	13.5	19.8	14.5
SWJS	00	Z	100	11	1	6.9	30.7	29.9
SWJS	12	Z	100	7	2	12.2	34.0	31.7
ZCBP6	00	Z	100	7	0	11.0	19.2	15.7
ZCBP6	12	Z	100	5	0	8.6	17.3	15.0
03953	00	Z	100	29	0	12.5	25.9	22.7
03953	12	Z	100	29	0	12.7	20.8	16.4
04018	00	Z	100	29	0	8.4	13.3	10.3
04018	12	Z	100	30	0	10.7	12.7	6.7
04220	00	Z	100	26	3	10.2	11.3	4.9
04220	12	Z	100	24	4	11.2	12.3	5.0
04270	00	Z	100	25	3	11.5	11.5	-0.3
04270	12	Z	100	25	4	11.8	12.0	-2.2
04339	00	Z	100	26	3	7.0	10.1	7.3
04339	12	Z	100	24	4	10.8	11.4	3.5
04360	00	Z	100	25	3	36.2	37.9	11.0
04360	12	Z	100	26	4	9.2	9.2	-0.1
08001	00	Z	100	24	3	20.2	21.7	7.9
08001	12	Z	100	26	2	18.1	18.9	5.7
08508	00	Z	100	28	0	19.5	30.3	23.2
08508	12	Z	100	30	0	21.4	26.5	15.7
08522	00	Z	100	21	0	15.5	28.9	24.3
08522	12	Z	100	29	0	14.2	21.8	16.6
08594	12	Z	100	5	0	11.9	52.8	51.4
60020	00	Z	100	26	2	10.9	38.0	36.3
60020	12	Z	100	25	2	17.2	35.7	31.2
71600	00	Z	100	28	0	15.0	16.3	-6.4
71600	12	Z	100	30	0	16.2	16.3	-1.8
72201	00	Z	100	28	0	19.7	31.9	25.1
72201	12	Z	100	30	0	16.6	34.2	29.9
72402	00	Z	100	24	0	13.6	31.1	28.0
72402	12	Z	100	30	0	12.0	50.4	49.0
74494	00	Z	100	26	0	12.6	14.4	7.2
74494	12	Z	100	30	0	9.6	15.5	-12.2
78016	12	Z	100	28	0	20.5	41.6	36.2

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
DASAP3	12	Z	500	1	0	0.0	1.0	1.0
DBBH	12	Z	500	17	0	6.9	9.7	6.8
EHOA	12	Z	500	19	0	9.6	19.9	17.4
ELML7	00	Z	500	13	0	10.4	15.2	11.2
ELML7	12	Z	500	15	0	9.5	11.8	6.9
FNCM	00	Z	500	10	0	8.8	21.2	19.3
FNCM	12	Z	500	12	0	10.2	22.4	20.0
FNOR	00	Z	500	11	0	6.8	8.5	5.1
FNOR	12	Z	500	11	0	10.7	16.6	12.6
FNOU	00	Z	500	12	0	13.3	15.5	7.9
FNOU	12	Z	500	16	0	9.6	12.2	7.4
FNPH	00	Z	500	12	0	5.2	8.1	6.2
FNPH	12	Z	500	10	0	29.7	29.7	-0.4
FNRS	00	Z	500	11	0	7.4	7.4	-0.5
FNRS	12	Z	500	13	0	5.6	6.8	3.8
LDWR	00	Z	500	29	0	7.6	7.7	-0.4
LDWR	12	Z	500	29	0	9.1	10.0	-4.2
OVYA2	00	Z	500	7	0	9.9	13.6	9.3
OVYA2	12	Z	500	8	0	13.9	17.4	10.4
SWJS	00	Z	500	11	1	10.6	15.3	11.1
SWJS	12	Z	500	8	2	7.5	12.5	10.0
ZCBP6	00	Z	500	7	0	4.8	9.2	7.9
ZCBP6	12	Z	500	5	0	11.8	11.8	-0.2
03953	00	Z	500	29	0	9.1	12.9	9.2
03953	12	Z	500	30	0	8.1	11.1	7.6
04018	00	Z	500	29	0	9.7	14.7	11.1
04018	12	Z	500	30	0	9.5	12.6	8.2
04220	00	Z	500	29	0	8.8	9.7	4.0
04220	12	Z	500	28	0	8.4	8.4	-0.1
04270	00	Z	500	29	0	9.6	10.1	3.1
04270	12	Z	500	30	0	10.8	10.9	1.0
04339	00	Z	500	29	0	6.9	9.6	6.6
04339	12	Z	500	30	0	11.6	11.7	1.5
04360	00	Z	500	28	0	16.5	17.0	4.3
04360	12	Z	500	30	0	8.2	8.3	1.5
08001	00	Z	500	28	0	12.7	12.7	-0.9
08001	12	Z	500	28	0	13.1	13.2	1.3
08508	00	Z	500	28	0	7.0	8.0	3.9
08508	12	Z	500	30	0	9.3	10.7	5.2
08522	00	Z	500	21	0	8.8	9.9	4.6
08522	12	Z	500	29	0	8.7	9.5	3.8
08594	12	Z	500	6	0	4.2	7.2	5.8
60020	00	Z	500	29	0	6.7	6.9	1.7
60020	12	Z	500	28	0	8.5	11.9	8.3
71600	00	Z	500	28	0	14.9	17.1	-8.3
71600	12	Z	500	30	0	12.4	12.6	-2.1
72201	00	Z	500	28	0	5.7	6.7	3.5
72201	12	Z	500	30	0	6.3	7.4	-3.7
72402	00	Z	500	27	0	6.2	9.4	7.0
72402	12	Z	500	30	0	7.0	8.1	4.1
74494	00	Z	500	26	0	11.8	11.8	0.9
74494	12	Z	500	30	0	8.0	8.9	-4.0
78016	12	Z	500	29	0	17.8	27.1	20.4

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :100 hPa.

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

```
 WMO   OBS               NUM    NUM      %
IDENT  TIME  ELM   LEV   OBS   GROSS    REJ     RMS    UBIAS   VBIAS

DASAP3  12    V    100     1      0       0     3.4     3.4    -0.5
DBBH    12    V    100    15      0       0    10.8    -7.4     1.4
EHOA    12    V    100    12      0       0     5.4     1.3    -2.6
ELML7   00    V    100     8      0       0     6.0    -2.4    -0.5
ELML7   12    V    100    10      0       0     6.5    -3.5    -0.8

FNCM    00    V    100    10      0       0     4.1    -0.3     0.7
FNCM    12    V    100    10      0       0     5.3     2.2     1.9
FNOR    00    V    100    10      0       0     3.7    -0.1     0.2
FNOR    12    V    100    11      0       0     4.2    -1.5    -0.5
FNOU    00    V    100    11      0       0     4.2    -1.3     2.1

FNOU    12    V    100    14      0       0     3.6     0.0     0.1
FNPH    00    V    100    11      0       0     3.9     1.2     0.0
FNPH    12    V    100    10      0       0     3.5     0.1     0.4
FNRS    00    V    100     7      0       0     2.0    -0.1     0.7
FNRS    12    V    100     6      0       0     3.8     0.9    -1.0

GWAN    12    V    100     1      0     100    26.5    16.6    20.6
LDWR    00    V    100    29      0       0     2.4     0.1    -0.7
LDWR    12    V    100    29      0       0     2.4    -0.3     0.2
OVYA2   00    V    100     6      0       0     2.4    -1.6     0.4
OVYA2   12    V    100     8      0       0     2.6    -0.1    -1.1

SWJS    00    V    100    11      0       0     3.3     1.2     0.8
SWJS    12    V    100     9      0       0     4.5     0.3    -1.9
ZCBP6   00    V    100     6      0       0     4.1     1.1     2.6
ZCBP6   12    V    100     5      0       0     2.9     0.8     1.1
03953   00    V    100    29      0       0     3.3     1.5     0.2

03953   12    V    100    29      0       0     3.2     0.2     0.0
04018   00    V    100    28      0       0     2.4     0.5    -0.5
04018   12    V    100    30      0       0     2.4     0.4    -0.2
04220   00    V    100    26      0       0     3.5    -0.7     0.6
04220   12    V    100    24      0       0     3.3     0.7     0.9

04270   00    V    100    24      0       0     3.2    -0.3     0.8
04270   12    V    100    25      0       0     2.7     1.2    -0.4
04339   00    V    100    26      0       3     6.5    -0.2    -0.1
04339   12    V    100    24      0       0     3.6     1.1    -0.5
04360   00    V    100    25      0       0     2.4     1.0     0.7

04360   12    V    100    25      0       0     2.3     0.0     1.0
08001   00    V    100    24      0       0     6.3     3.3    -0.7
08001   12    V    100    24      0       0     4.9     0.8     0.3
08508   00    V    100    18      0       0     4.5     1.6    -0.4
08508   12    V    100    19      0       0     3.9     0.5     1.0

08522   00    V    100    19      0       0     3.8     1.5     0.9
08522   12    V    100    27      0       0     4.8     1.0     1.1
08594   12    V    100     5      0     100     4.6    -2.3     2.9
60020   00    V    100    22      0       0     4.6     1.1     0.6
60020   12    V    100    24      0       0     5.8     0.7     1.8

71600   00    V    100    28      0       0     3.7     0.4    -0.1
71600   12    V    100    30      0       0     4.3     0.4    -0.4
72201   00    V    100    28      0       0     4.6    -1.0     0.9
72201   12    V    100    30      0       0     3.9    -0.4     0.5
72402   00    V    100    24      0       0     4.5    -0.8    -0.2

72402   12    V    100    29      0       0     3.8    -0.2    -0.4
74494   00    V    100    26      0     100     3.8    -0.7    -0.5
74494   12    V    100    29      0     100     3.2     0.6     0.0
78016   12    V    100    28      0       0     4.9     0.9     1.4
```

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: April 2001

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

```
 WMO   OBS               NUM    NUM      %
IDENT TIME ELM   LEV   OBS   GROSS    REJ     RMS    UBIAS   VBIAS

DASAP3 12    V   500     1      0      0     0.7     0.6    -0.4
DBBH   12    V   500    16      0      0     3.4     1.4     0.0
EHOA   12    V   500    14      0      0     4.4    -0.9    -0.3
ELML7  00    V   500    10      0     10    14.0    -3.9     1.5
ELML7  12    V   500    13      0      0     4.1     0.1     1.0

FNCM   00    V   500    10      0      0     3.4    -0.4    -0.1
FNCM   12    V   500    11      0      0     3.9    -0.9     0.6
FNOR   00    V   500    11      0      0     3.3     0.9    -0.1
FNOR   12    V   500    11      0      0     3.9    -0.3    -1.3
FNOU   00    V   500    11      0      0     5.4     0.3    -2.3

FNOU   12    V   500    15      0      0     4.1     0.2    -0.4
FNPH   00    V   500    11      0      0     3.2     0.5    -0.4
FNPH   12    V   500    10      0      0     3.9    -0.7     0.0
FNRS   00    V   500     8      0      0     4.8    -0.7     1.2
FNRS   12    V   500     7      0      0     4.8     0.3     1.3

GWAN   12    V   500     1      0    100    25.4    12.4    22.1
LDWR   00    V   500    29      0      0     3.2     0.0     0.2
LDWR   12    V   500    29      0      0     3.3     0.0     0.2
OVYA2  00    V   500     6      0      0     5.5    -0.9     1.0
OVYA2  12    V   500     8      0      0     3.7     0.5     1.8

SWJS   00    V   500    12      0      0     4.0     0.9     0.9
SWJS   12    V   500    10      0      0     6.5    -1.8     1.9
ZCBP6  00    V   500     6      0      0     3.9    -0.4     1.0
ZCBP6  12    V   500     4      0      0     3.9    -2.1    -0.4
03953  00    V   500    29      0      0     5.4    -0.2    -1.2

03953  12    V   500    30      0      0     5.4     1.9     0.3
04018  00    V   500    29      0      0     3.2     0.2    -0.3
04018  12    V   500    30      0      0     4.7     0.6    -0.4
04220  00    V   500    29      0      0     4.2    -1.1    -0.4
04220  12    V   500    28      0      0     5.4     0.8     0.5

04270  00    V   500    28      0      0     3.8    -0.3     0.1
04270  12    V   500    30      0      0     4.0     0.5    -0.2
04339  00    V   500    28      0      0     4.6    -0.4    -1.4
04339  12    V   500    30      0      0     5.0     0.2    -0.3
04360  00    V   500    28      0      0     3.7    -0.6     0.4

04360  12    V   500    30      0      0     3.5     0.5     0.7
08001  00    V   500    28      0      0     4.8     1.7     0.7
08001  12    V   500    27      0      0     4.0     0.3     0.4
08508  00    V   500    21      0      0     3.8    -0.8    -0.8
08508  12    V   500    23      0      0     3.8    -0.1    -0.2

08522  00    V   500    20      0      0     2.6    -0.4     0.4
08522  12    V   500    27      0      0     3.5    -0.4     0.9
08594  12    V   500     6      0    100     5.4     2.5    -0.7
60020  00    V   500    28      0      0     4.0     0.0     0.0
60020  12    V   500    27      0      0     4.0     0.7     0.6

71600  00    V   500    28      0      0     4.6     0.1     1.3
71600  12    V   500    30      0      0     3.8     0.4    -0.7
72201  00    V   500    28      0      0     3.2     0.0    -0.4
72201  12    V   500    30      0      0     2.5    -0.2     0.0
72402  00    V   500    25      0      0     3.9    -0.1     0.8

72402  12    V   500    29      0      0     3.5     1.2     0.5
74494  00    V   500    25      0    100     4.0    -1.8    -0.2
74494  12    V   500    30      0    100     4.2    -0.2     1.3
78016  12    V   500    29      0      0     4.0     0.3     0.6
```

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45